

Statement Testimony of

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Introduction

Good afternoon Madam Chairwoman, Ranking Member Miller and Members of this Committee. I am pleased to be here today on behalf of the dedicated men and women working across the Department of Defense (DoD), who discover, develop, engineer, and field the critical technologies for our Service Members, and civilians deployed in the defense of our Nation. I would like to thank the members of Congress for your continued support of the Department's science and technology (S&T) program and our broader research and engineering (R&E) program¹.

I am also honored to be joined today by Ms. Linda Oliver, Acting Director of the Office of Small Business Programs in the office of the Under Secretary of Defense (Acquisition, Technology and Logistics); she will speak specifically to the Small Business Innovation Research (SBIR) Program.

My comments today will center on the critical role of the small business community in driving invention and innovation to quickly launch new capabilities that support our warfighters and protect our nation. I will specifically address the scope of the Department's engagement with the small business sector, which complements the SBIR program and which is providing key capabilities for our warfighters in harm's way. Across the Department in FY09, this amounted to \$63.9B in funding².

An Integrated S&T Enterprise

The Department's S&T enterprise encompasses a remarkable pool of talent and resources. Our footprint includes 67 DoD laboratories in 22 states with a total workforce of 61,400 employees. Of these, 35,400 are degreed scientists and engineers leading their fields and reporting their work in peer-reviewed conferences and journals. We operate 10 Federally Funded Research and Development Centers (FFRDCs), 13 University Affiliated Research Centers and 10 Information Analysis Centers (IACs) across critical disciplines for the

¹ Science and Technology (S&T) is defined as the sum of basic research (6.1), applied research (6.2) and advanced technology development (6.3). Research and Engineering (R&E) is S&T plus Advanced Component Development and Prototyping (6.4). Both S&T and R&E are activities that occur before initiation of formal acquisition programs.

² Website: Department of Defense Office of Small Business Programs, Program Goals and Statistics;
<http://www.acq.osd.mil/osbp/statistics/goals.htm>

Department. These institutions enable the Department to connect with top technical talent across the Nation in fields ranging from cyber security to ballistic missile defense to advanced microelectronics and more. They provide first class system engineering talent, objective red team assessments, gold standard test and evaluation, deep research talent and innovative paths for rapid prototyping.

Coupled to this enterprise, the Department also enjoys a strong relationship with the small business community through a variety of programs designed to foster collaboration. These include the SBIR program, the Defense Acquisition Challenge, the Rapid Reaction Fund and Quick Reaction Fund, the Open Business Cell and the Defense Venture Catalyst Initiative Program about which more details are included below. Each of these represents an avenue of innovation and a path to bring ideas into the Department and transition concepts developed in DoD Laboratories to commercial use.

Role of Small Business in Driving Invention and Innovation

The Department needs new capabilities for our warfighters to operate effectively against current threats and in anticipation of future challenges. In this context, much has been written about the small business model of driving invention and innovation^{3 4 5}. The small business community attracts entrepreneurial talent who enjoy tackling difficult multidisciplinary challenges, where the role of the individual investigator as integrator often makes the difference between success and failure. The ability of the small business community to rapidly form new teams or launch new companies, which deliver accelerated adaptation with the speed of the commercial marketplace, offers new opportunities for the Department in its rapid fielding acquisition strategy.

To extend innovation speed to the warfighter, we have focused on better connecting the small business community with the needs of the Department through a variety of mechanisms. Through these activities, small businesses are able to understand the capability and technology

³ Block, Fred and Matthew R. Keller, "Where Do Innovations Come From? Transformations in the U.S. National Innovation System, 1970-2006", *The Innovation Technology & Innovation Foundation*, Jul 2008, p 2- 22
http://www.itif.org/files/Where_do_innovations_come_from.pdf

⁴ Chesbrough, Henry W, "The Governance and Performance of Xerox's Technology Spin-off Companies", *Research Policy*, Mar 2003, Vol. 32 Issue 3, p403, 19p [http://www.fep.up.pt/disciplinas/ce714/Chesbrough%20\(2002\).pdf](http://www.fep.up.pt/disciplinas/ce714/Chesbrough%20(2002).pdf)

⁵ Taylor, E. Jennings, Ph.D., "A Small Business Model for Facilitating Partnerships in the Innovation Ecosystem", a White Paper, Faraday Technology/Physicals Sciences, Inc. http://www.psicorp.com/pdf/open_inn-business_model.pdf

requirements of large system users (e.g., the Combatant Commands (COCOMs)) and have access to ranges and training facilities to conduct real-time field experimentation.

Tighter Connection to the Department's Needs

Through publications, conference speaking engagements, field site visits and hosted meetings with operators, the Department's S&T leadership continues to engage the small business community with an understanding of the Department's current and future challenges. In many cases, simply providing access to a field unit or operator has opened channels of innovation for new capabilities. We have provided small business with access to our S&T Advisors across the Combatant Commands and are strengthening our S&T engagement to support the department's Joint Urgent Operational Needs. In both cases, early engagement with the small business community has resulted in key accomplishments.

One such example is the recent development of the Army Helicopter Alert & Threat Termination – Acoustic (HALTT-A) system. I was honored last week to spend a day with the Army Combat Aviation Brigade who will soon be deploying with this capability. This technology, developed by a then small business, allows pilots to initiate evasive maneuvers, or return fire, by identifying the direction from which the rounds were fired. This effort took just eight months from the initial funding decision to finalization of the deployment package. The success of this effort was due, in large part, to collaboration between engineers, integrators and service men and women who, as a multi-functional team incorporated technical depth and end-user inputs from the initial development at Fort Eustis, to testing at Fort Rucker and Aberdeen Proving Ground. This eight month timeline was not easy, but it was due to the tenacity and problem-solving of this team and exemplifies the need for a tight connection to the warfighter.

Access to the Department's Training Facilities and Test Results

While their size allows for speed and agility, small businesses operate with fewer resources to test and operationalize their technologies. Access to the Department's training facilities and test results is just as important to a small business as access to the warfighter. Without this access, industry in general, and the small business sector in particular, have little insight into the fundamental technical and operational challenges to address.

One example of this type of access is the Joint Experimental Range Complex (JERC) at the U.S. Army Yuma Proving Ground. This facility allows small businesses to test a wide range of technologies in a realistic environment. By operating low-cost ground and intelligence, surveillance, and reconnaissance (ISR) test platforms, the Department has been able to offer new opportunities to demonstrate and refine urgently-needed capabilities in real-world conditions at modest cost. This has enabled the Department to reach out to businesses that have not traditionally done business with DoD. As a result, companies have been able to test, obtain their results and refine their technologies in an environment representative of the current areas of ongoing conflict. Joint services testing support is offered one week of every two months for technologies without enough funding for testing to show their capabilities in a real world setting. Work at the JERC has involved many offices within the Navy and Marine Corps, as well as the primary customer, US Central Command. Successful demonstrations are presented to appropriate organizations to take the technology to the next stage and ultimately transition. Unsuccessful but promising technologies are invited back when improvements are completed.

Exemplar Small Business Successes

Examples of unique ways in which the Department couples with the small business community on time-critical challenges include the Rapid Reaction Fund (RRF), the Quick Reaction Fund (QRF), the Defense Acquisition Challenge (DAC), the Open Business Cell (OBC) and the Defense Venture Catalyst Initiative (DeVenCI) program. The Department's RRF and QRF efforts focus on small business solutions for operational challenges. One example is the Augmented Reality Visualization of the Common Operating Picture (ARVCOP) project. This concept was funded through RRF and resulted in an augmented reality tactical display that allows sailors to visualize hazards, sea lanes, markers, etc., in reduced visibility. In a similar engagement model with industry, the QRF funded the Inflatable Satcom Antenna, which developed 1.8m and 2.4m satellite antennas that can be folded into duffel bags for transportation. The antennas can be quickly set up and broken down for storage. This capability greatly reduces the logistics requirements (size and weight) when compared to moving similar sized traditional satcom antennas. The Marine Corps is using the Inflatable Satcom Antenna systems.

The DAC program was designed to reach out to small businesses and those companies that do not normally work with the Department. The program allows anyone to demonstrate a product or process, which can enhance a current warfighting tool or deliver a new capability. This approach serves as an "on-ramp" to companies who may not be major DoD contractors. To date 60 percent of the successful DAC projects have been with technology providers at the small- or mid-sized enterprise level. Thirty-six DAC projects have yielded technology that is now in use by our warfighters in Iraq, Afghanistan, or at U.S. facilities. Two noteworthy DAC successes conducted with small businesses are the Mini-Combat Trauma Patient Simulator (Mini-CTPS) and the Portable Oxygen Generator. The Mini-CTPS, with physiological models tailored for training mass casualty and triage, allows students to see it, hear it, breathe it and live it with the patient. More than 3500 corpsmen deployed in OIF/OEF have trained on the Mini-CTPS with over 50 training units fielded worldwide, including Kuwait. The Portable Oxygen Generators are in Army MRAP and Stryker ambulances where they replace the bulky and hazardous oxygen bottles that could explode during an encounter with an IED. The Portable Oxygen Generator produces patient oxygen from the air and weighs one-tenth of the oxygen bottle it replaced, reducing the logistical burden and increasing the safety of soldiers. Over 2,700 units are deployed in Iraq and Afghanistan.

In February 2009, we launched an Open Business Cell, which uses a web-based interface to more effectively couple the Department with small business. The approach has lowered the barrier for small, non-traditional businesses to engage DoD directly to resolve some of its needs. In its first year, the OBC solicited novel open, public solutions for battlefield forensics problems. Forty-four percent of the 96 responses were from small businesses, entrepreneurs, and inventors that had never done business with DoD. Avett, Inc. (Maryland) was competitively selected to develop a prototype solution to a Battlefield Forensics problem. The OBC's current challenge set - methods for non-lethal stopping of vehicle - has generated 30 solution ideas, 55% of which are from non-traditional, small businesses.

Lastly, the DeVenCI program identifies small companies with emerging commercial technology products that solve current DoD needs. Under DeVenCI sponsorship, CommsFirst (Peachtree City, GA) developed a compact communication capability that links tactical radios to cell phones. After initial introduction and deployment with the Defense Intelligence Agency, Customs and Border Protection personnel procured sixty units.

There are many examples of outstanding success stories in the DoD's acquisition of advanced technology from small businesses. In many cases we develop initial technologies in

our DoD laboratories and then work with small businesses to license those technologies for further development and production. Three examples of successful technology transfer between DoD and small businesses include the following:

- The Pelican hybrid airship, an advanced technology demonstrator in development by Aeros, a small company based in Tustin, California. Supported with an interagency agreement between the Rapid Fielding Directorate (RFD) of DDR&E and NASA, Aeros is developing a new technology to demonstrate variable buoyancy control of an airship. This technology will provide a solution to the tyranny of distance that can be employed by TRANSCOM and other COCOMs. This engagement has provided Aeros with engineering depth from the technical expertise of NASA engineers and a direct connection to the end user through inputs from TRANSCOM to help define a meaningful capability.
- Lewis Machine & Tool Company, Milan, IL, was issued a partially exclusive license by Naval Surface Weapon Center Crane to produce an innovative firearm butt stock design that incorporates two watertight removable storage tubes, providing improved performance for the warfighter and extra storage space for small items. More than 30,000 units have been sold to the military and 10,000 have been sold commercially, resulting in patent royalties in excess of \$67,000.
- SKEDCO, Inc, Tualatin, OR, has a Patent License Agreement and a Cooperative Research & Development Agreement with the US Army Medical Research and Materiel Command to produce the Field-Expedient Bleeding Simulation System, a remote operated bladder system that simulates realistic bleeding wounds while providing the illusion of treatment. This system provides improved medic training for soldier and civilian responders for traumatic, bleeding wound treatment in the field. 61 systems have been sold to 32 different organizations in the U.S. Army, Navy and Air Force in 18 states. Another 30 systems have been sold to academia and industry both in the U.S. and abroad.

Summary: Increased Opportunities for Small Business

The Department has implemented a diverse set of programs aimed specifically at the small business community. For example, the SBIR program solicits new ideas three times a year. The Small Business Technology Transfer program, which solicits participation twice a

year, uniquely offers small businesses and universities the opportunity to team and bid on projects. The Department also monitors and strives for compliance with the specific and targeted goals established for small business participation in DoD contracting.

The Department recognizes the unique and important roles that small businesses can play in assisting us to improve acquisition efficiency, support the warfighter and promote real competition. In his recent memo entitled “Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending”⁶. Dr. Ashton Carter, Under Secretary of Defense (Acquisition, Technology and Logistics), further emphasized the importance of small businesses when he directed that:

- the acquisition community increase the role of small businesses in defense marketplace competition;
- the Components significantly increase their understanding of small business capabilities and ensure small business utilization is maximized;
- the Components emphasize small business utilization through the use of weighting factors in all competitive and non-competitive procurement actions; and
- the Defense Office of Small Business Programs be included as a member of the Office of the Secretary of Defense peer reviews of service acquisitions.

DDR&E is also investigating the development and implementation of our own small business initiatives. Although we are already significantly engaged in the existing OSD SBIR program, my staff and I believe that there is a broader set of programs that we can employ to take advantage of the unique capabilities found in the small business community. For example, we are now looking into ways that we can exploit SBIR authorities to address identified COCOM requirements, either augmenting ongoing projects or developing new solicitation topics.

As part of the Defense Industrial Base, small businesses represent a cadre of entrepreneurial innovators who bring new technology solutions and agility to the challenges we face. The efforts, I have highlighted above center on connecting small business invention and innovation to quickly launch new capabilities that support our warfighters and protect our nation. Thank you very much for this opportunity to describe the Department’s engagement strategy for small businesses.

⁶ The Office of the Under Secretary of Defense (Acquisition, Logistics and Technology), Washington DC, September 14, 2010, Memorandum for Acquisition Professionals
http://www.acq.osd.mil/docs/USD_ATL_Guidance_Memo_September_14_2010_FINAL.PDF?transcriptid=4648