PREPARED STATEMENT

OF

NICHOLAS KARANGELEN, President of Trident Systems Incorporated
and
Board Member of the Small Business Technology Coalition

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HOUSE ARMED SERVICES SUBCOMMITTEES
on
TACTICAL AIR AND LAND FORCES
and
PROJECTION FORCES

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Chairman Weldon, Chairman Bartlett, Ranking member Abercrombie, Ranking member Taylor and distinguished members of the Committees, it is an honor to have the opportunity to appear before you today to discuss my personal experiences working within the Department of Defense acquisition process and the advantages small technology business offer the DoD. I am Nick Karangelen, founder and president of Trident Systems Incorporated of Fairfax, Virginia. Trident is a high tech small business and has been providing technology solutions to the Department of Defense for the last 20 years including the largest collaboration facility in US Navy history, the first wireless local area network on a US Navy nuclear submarine, and a spectrum of compact affordable display, control, and communications systems for all branches of the United States Armed Forces. Trident also has a large commercial customer base and has provided real-time touch screen solutions to hundreds of companies in over forty countries including the New York and Toronto stock exchanges, Caterpillar and GM factory floors, and Motorola 911 call centers across the country. I am also the Chairman of Small Biz Tech PAC and a board member of the Small Business Technology Coalition (SBTC) which represents many high technology small businesses who supply products and services to the Department of Defense and other Federal agencies

With me today is Rich Carroll president of Innovative Defense Strategies LLC and formerly president of Digital System Resources. Together, we have over 40 years of chief executive officer experience in the small business high-technology sector. We also serve together as board members of the Small Business Technology Coalition. The Coalition is a non-partisan, nonprofit industry association of companies dedicated to promoting the creation and growth of research-intensive, technology - based U.S. small business.

I'd like to begin by thanking each member of this Committee for the outstanding effort you make every day to support our men and women around the globe as they protect our nation and wage the war on terrorism.

My small business colleagues and I also thank your Committee for your interest the Nation's small business community that serves the Department of Defense. Small business is widely recognized as the engine of innovation in America and the catalyst for developing ground-breaking technology and novel products. In February 2000 the US Small Business Administration's (SBA) Office of Advocacy published a working paper[1] summarizing the results of a number of earlier studies addressing small business in the US economy. The working paper reported that small businesses employed just over half (53%) of the US work force, over a third (36%) of the degreed engineers and scientists, and accounted for 14% of all non-federal expenditures of R&D in the US. A study conducted by the National Science Foundation titled *Will Small Business Become the Nation's Leading Employer of Graduates with Bachelor's Degrees in Science and Engineering?*[2] concluded, "as a group, small businesses hire as many recent S&E graduates as do larger ones, and also as many of all other sectors of the U.S. economy combined". The SBA white paper also

[1] *A New View of Government, University, and Industry Partnerships*, Office of Advocacy, U.S. Small Business Administration, February 2000.

[2] *Will Small Business Become the Nation Leading Employer of Graduates with Bachelor's Degrees in Science and Engineering?*, Division of Science Resource Studies, National Science Foundation, January 1999

points out that small business participation in Federally funded research and development has consistently been reported as less than four percent, far below their percentage of technology employment, industrially funded research and development, and other indicators of business innovation (e.g. patent awards). In fact, just the top 100 Department of Defense contractors received 88.9% of DoD RDT&E funding in 2003 (in an increasing trend from 85.5% in 2001.) This reflects the growing strong preference of DoD Program Managers for large contractors and the missed opportunities to leverage both the significant R&D capabilities represented by small firms as well as the products small firms have developed under their own industrially funded research.

Over the last decade several significant and highly visible examples of how small business can dramatically improve weapon system performance at significant cost savings in large military programs of record have been widely recognized and understood. Programs like Acoustic Rapid Commercial-off-the-shelf Insertion (A-RCI) discussed by Mr. Carroll have left no doubt that small innovative technology businesses provide a critical element in achieving real transformation in weapon system acquisition processes and order-of-magnitude improvement in performance and affordability. It is important to note that most of these cases of significant small business technology participation in major programs of record would not have occurred without strong support from the Congress. The overwhelming majority of significant small business technology offerings to DoD programs of record "wither on the vine" because they represent a disruption to the "business as usual" approach by DoD program offices and prime contractors. This illustrates the underlying resistance to change in DoD weapon system acquisition and the significant challenge for small high-technology firms (even those with a proven track record serving the DoD).

In the overwhelming majority of cases, small businesses which have successful relevant capabilities and technologies do not achieve major positions in DoD acquisition programs of record. In some cases, the small business technologies may be seen as competing with established program interests or as a distraction from the program's plan. Some program managers may be unwilling to invest program funds in alternative technology candidates when they believe (as most do) that their programs are on track. Prime contractors are often polite but generally unwilling to bring in a promising externally developed (and potentially disruptive) technology when they have an internally developed alternative or believe (as most do) they can reasonably develop an alternative internally. In most cases, even well intentioned attempts to include small business in major DoD programs fall short because of factors unrelated to the high technical quality, reduced costs, and shorter development times offered by small business and their technology solutions. These missed opportunities represent what I believe to be the largest single impediment to weapon systems acquisition transformation today.

I would like to briefly describe two cases of "missed opportunity" illustrating the challenges small technology businesses face. The first case is a retrospective look at an Army missed opportunity with regard to a hand held situation awareness technology developed by Trident named DISM (Dismounted Intelligence Situation Mapboard). The second case is a look ahead at a promising Navy initiative named Open Architecture wherein the Navy is at risk of missing a significant opportunity to rekindle innovation and competition in the development of the coming generation of naval ship combat systems.

DISM development was initiated in FY1996 as part of an Army research initiative to determine if it was possible to provide standard digital military maps (supplied by NIMA) with standard military symbology and standard military digital messaging on, what was then, the early generations of commercially available hand held computers. The goal was to provide map-based situation awareness to dismounted troops on small light hand held computers at affordable cost.

DISM capabilities were successfully demonstrated in FY1999 by Trident and subsequently integrated and tested with the Army's FBCB2 program and briefed to the Land Warrior program. Using DISM, any unit can have an instant tactical digital network for situation awareness (SA) and command and control (C2) data by connecting the DISM palmtop to the unused digital channel of their fielded SINCGARS radios. However DISM has remained outside of the traditional Army acquisition channels even after receiving a very favorable evaluation as the dismounted extension to FBCB2 and being recognized by several operational commanders (82nd Airborne and 101st Airborne) as an opportunity to field a near term, low cost dismounted digitization capability. In the face of strong support for DISM by the operational forces, in the wake of failures by two large prime contractors to deliver an acceptable solution (at a cost of 100's of millions of dollars), and instead of evaluating DISM, which the Army laboratory at CECOM had supported, the Army's PEO for Soldier systems initiated development of a new system called Commander's Digital Assistant (CDA) in FY2002 which essentially copied the DISM functionality (including using DISM graphics in program briefings). CDA has recently be heralded as a Army success story however there has been no widespread deployment of CDA or head-to-head test against DISM which is now a mature demonstrated and tested technology.

The second case I'd like to briefly describe involves a Navy surface ship combat system initiative named Open Architecture (OA). An open architecture requires that combat system design be well structured and modular with well defined interfaces and documented non-proprietary communications data structures and system / sub-system behavior. The OA approach provides the mechanism for efficient integration of subsystems developed by different vendors and is the foundation for rapid insertion of new technologies and the enabler of competition for system and sub-system upgrades as well as for integration of Joint initiatives such as the Track Manager under development by the Joint SIAP Systems Program Office (JSSEO) for implementation across the Services. OA has been recognized by Navy leadership as an essential initiative and the Program Executive Officer for Integrated Warfare Systems (PEOIWS) has established an office specifically for promotion of this important and potentially vital effort. A considerable effort has been made by this office to define the goals of OA and to characterize the essential elements required to achieve them. A comprehensive outreach to small and large contractors, Navy program sponsors and program offices, laboratories and academia, and the Fleet has provided all key Navy combat system stakeholders with an opportunity to participate in the establishment of the Navy OA initiative. However, while the merit of open architectures in Navy combat systems is well appreciated, it represents a significant departure from the existing traditional monolithic combat system development approach currently supported by Navy program offices and prime contractors.

There exists considerable (and perhaps even understandable) resistance to change both in the program offices and prime contractors which are now engaged in development and upgrade of the current generation of Navy ship combat systems. (After all they did develop the ships and systems which won the Cold war and which are arguably without peer in the world today.) These program

offices and prime contractors have a strong investment in the existing monolithic approach (i.e one large prime contractor who is responsible for the program). The prime contractors have well established business positions and defend their turf by erecting what ever barriers to entry they can for their competition. While the program offices have been open to discussing the merits of the OA approach and quick to identify how they are currently implementing OA elements into their programs, they also are not often successful forcing significant change on their prime contractors who largely determine the fate of the program. The primes appear firmly entrenched and are skilled at constructing the case for their continuing role as monolithic system provider and gate keeper for innovative, competitive (and of course potentially disruptive) technologies.

Over the past two decades, the complexity of Navy combat systems has rapidly increased while the available staffing for Navy Program offices has been reduced. In the name of efficiency, the burden of managing large complex systems development has shifted from the program offices to their large prime contractors and has allow the primes to establish dynasties which have been sustained over many years. These circumstances have created an environment which is not likely to embrace the Open Architecture initiative, viewed by many as a necessary step in regaining the competitive innovation so vital to the future of Navy combat systems. It appears very unlikely that the existing prime contractors will establish truly open architectures for the Navy's next generation of combat systems (enabling continuous and open competition for system and subsystem upgrades) and equally unlikely that the Navy's program managers will overturn those entrenched prime contractors in the near term.

I believe these challenges merit the significant concern shown by your Committees in conducting this hearing. I would like to strongly reiterate the recommendation made earlier by my colleague Rich Carroll that the Congress and the Administration create "The Commission on Defense Innovation and Transformation" to develop additional recommendations for the modification of Defense Management processes to facilitate innovation and transformation. As the engine of innovation in America, small business represents the DoDs' single largest resource and ally in transforming weapon system acquisition and in supporting continuous competitive innovation in weapon system upgrades. We stand ready to support you and the Administration in transforming America's weapon systems acquisition and delivering affordable, capable technology through a continuous competitive innovation process.

I thank you again for your willingness to hear our perspectives on the increased role that the nation's small business community could have in bringing the brave men and women in uniform who are protecting our nation's freedom around the world and waging the war on terrorism with better technology at lower cost. In closing I thought the following remarks made by the President to the Midshipman at the Annapolis graduation just a few weeks ago were particularly timely with respect to this hearing "...As you begin your military careers, we need you to bring that same spirit of creativity and innovation to your work. Seek out the innovative leaders in our military, work with them and learn from them, and they will help you to become leaders yourselves. Show courage, and not just on the battlefield. Pursue the possibilities others tell you do not exist. This advice comes with a warning: If you challenge established ways of thinking, you will face opposition. Believe me, I know, I've lived in Washington for four years. The opponents of change are many, and its champions are few, but the champions of change are the ones who make history. Be champions, and you will make America safer for your children and your grandchildren, and you'll add to the character of our nation."