A Postcard from the Valley of Death

Testimony to the House Committee on Science and Technology

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Thank you Chairman Wu, and Committee Members for the opportunity to speak with you today about the NIST 2009 Budget Request in particular and U.S. Innovation Policy in general.

Seven years ago I committed an unthinkable act. I left a comfortable and reasonably well-paid job as a research scientist at Lawrence Livermore National Lab and set off to create a new business oriented around a novel optical manufacturing technology called Reactive Atom Plasma processing. The technology was developed at Lawrence Livermore National Lab by my co-founder, Dr. Jeffrey Carr, but was viewed by Laboratory management as too immature. In fact, when I first learned about the technology the only prototype was sitting under a tarp on a loading dock outside one of the laboratory buildings.

Taking a new technology from the benchtop through to a demonstrated commercially viable product is an enormous undertaking. It is easy to demonstrate that a new technology works at some rudimentary level in a laboratory setting. It takes a tremendous amount of engineering, testing and market analysis to make a new technology work reliably, economically and fit within the needs of the marketplace. This journey is often referred to as crossing the "valley of death", and it is an absolutely critical process for the U.S. economy and economic competitiveness.

So, having been through the Valley of Death, I'd like to share with you some observations about how this process REALLY works, how federal policy can help, and specifically orient my comments to the TIP program and it's previous incarnation – ATP. I would also add that I have spoken to many other technology entrepreneurs and their experiences are similar to my own.

No matter what their politics, nearly everybody believes that technology innovation is a key factor in U.S. economic growth. Our ability to take scientific discoveries from the laboratory and turn them into productivity-enhancing technologies that rapidly proliferate in the national and international market is a key strength of the U.S. economy. Small technology businesses play a particularly important role – they, and the entrepreneurs who found them – take the risks on new technologies because that's the only way they have to get a foothold in the marketplace.

While we would like to all believe that the U.S. is the best in the world at fostering this sort of entrepreneurship I have to impress upon you how difficult the process of technology commercialization actually is – and how vital tools such as ATP and TIP are to entrepreneurs such as myself.

Contrary to popular belief in Washington D.C. venture capital is NOT a major funder of new technologies at the earliest stages of commercialization. Venture capital shies away from such investments because of the long and uncertain pathway that technologies must travel to demonstrate economic viability. Venture capital ONLY focuses on funding opportunities that are less than 5 years away from profitability, have the potential for enormous equity appreciation, and fall within a narrow range of markets. Most new technologies do NOT fit this model, and most, like my company, don't get funded. Technologies with enormous potential to help the US economy, in fields such as manufacturing and transportation, do NOT make attractive investments for venture capitalists. This is not to say that venture capital is not vital – it is – but it cannot be relied upon to support early-stage, high-risk technology commercialization across the board – and any venture capitalist you spoke with would confirm this.

Ironically, the most important "venture capitalist" for early-stage technologies is Uncle Sam. The federal government supports cutting edge technology development in small businesses through a range of programs such as SBIR, Cooperative Research and Development Agreements (CRADAs) and other contract mechanisms. My company has benefited from many of these programs, and all of them were helpful in keeping us alive as we marched through the valley of death.

But out of all these programs, the ATP stands out as particularly effective. Our company won an ATP in 2003 and, while it was far from the largest R&D contract we received, it was the most potent. ATP (and TIP) are unique in several respects. First – these programs focus on technologies with the greatest potential for the U.S. economy. In contrast, programs like SBIR, focus on topics and technologies that are of interest to the sponsoring agency – ands those topics tend to be very narrow and with limited commercial application. Second, ATP grants support early-stage technology commercialization for several years – SBIR Phase 1 grants are as short as 6 months – hardly enough time to travel the valley of death. Third, ATP couples financial support with business development advice and expertise. We were paired with an extremely helpful business analyst from NIST who helped us identify several key potential customers and new applications. Lastly, the ATP program is efficient and well-run – despite a highly competitive and rigorous review process, funding decisions happen quickly. In contrast, programs such as SBIR can take many months to select projects, and several months more to get under contract – technology development proceeds at a snail's pace.

ATP was so valuable to my company, and to many others, because it was well-aligned to the needs of a small business. ATP encouraged and facilitated collaboration with end customers – rather than simply tolerating it.

In a nutshell: a focus on high-risk/high reward technologies, multi-year funding, business advice, and efficient program management made ATP extremely effective for helping small technology-based businesses such as mine. TIP appears to carry on these principles – but without much funding it doesn't help us.

I do not mean these comments to be interpreted as a criticism of SBIR and other funding mechanisms – we entrepreneurs are grateful for all the help we can get! But the argument that ATP or TIP is somehow redundant or unnecessary is simply incorrect. In my opinion it is the BEST program the federal government has that supports technology commercialization.

I would not have been able to do what I did without the ATP. And had there been no ATP or TIP, I would have been a lot less inclined to quit my job at Lawrence Livermore Lab and try.

Thank You – I would be happy to answer your questions.

Dr. Peter S. Fiske (MBA - U.C. Berkeley, 2002, Ph.D. - Stanford University 1993)

Prior to starting RAPT Industries, Inc., Dr. Fiske led a research team at Lawrence Livermore National Laboratory in condensed matter physics. His business plan for RAPT Industries won First Place at the 2001 U.C. Berkeley Business Plan Competition. He is the author of 20 technical articles in leading scientific journals including SCIENCE and 2 books. In 1996 Dr. Fiske was awarded a White House Fellowship and served in the Pentagon as Assistant to the Secretary of Defense for Special Projects. His other awards include an NSF Graduate Fellowship (1988-91), a STA Fellowship by the government of Japan (1995), the U.S. Department of Defense Outstanding Achievement Award (1997) and an Aspen Scholarship at the Aspen Institute in 2001. Dr. Fiske was CEO of RAPT Industries from May, 2001 to April, 2004.