THE 2010 FLC MID-CONTINENT REGION ANNUAL AWARDS

SAND2010-4753P

Nomination Form

Please note the specific criteria for the nominated award.

I nominate the following individual, technology, or organization for the following award (please √):

- ❑ Regional Laboratory Award
- ❑ Representative of the Year Award
- ❑ Notable Technology Development Award
- ❑ Regional Partnership Award
- ❑ STEM Mentorship Award (New Category!)
- ✓ **Excellence in Technology Transfer**

Nomination submitted by: Jackie Kerby Moore
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Nominee's Name: Richard Fairbanks, Entrepreneurial Separation to Transfer Technology (ESTT) Program Manager
Affiliation: Sandia National Laboratories
Laboratory Director/CEO or Point of Contact: Paul Hommert T#/email: 505-844-8789, pjhomme@sandia.gov

Basis for the nomination. Summarize in space below. Up to two additional pages of written justification may be appended. Total nomination should not exceed **two pages**, Times 12 pt, 1 ½ line spaced. Artwork, photographs are ***strongly*** encouraged and are not included in the page count.

ESTT – Entrepreneurial Separation to Transfer Technology

Basis for Nomination—Excellence in Technology Transfer

The National Competitiveness Technology Transfer Act of 1989 made technology transfer a mission of government-owned, contractor-operated (GOCO) laboratories and their employees.

Traditionally successful technology transfer has been seen as:

- Movement of scientific knowledge, processes, devices – intellectual property (IP) – from research laboratories to the commercial sector where these transfers are successfully marketed, which enhances the financial bottom line of the receiving companies, and creates jobs. Typically transfer mechanisms have been through cooperative research & development agreements (CRADAs), licenses, work for others (WFO) agreements, and transfer of people from labs to help start-up new companies or expand existing businesses.
- Technologies, products, or families of products with both commercial and federal applications being developed.

Sandia's Entrepreneurial Separation to Transfer Technology (ESTT) program has been achieving all of these traditional technology transfer success measures since its birth 16 years ago; however, in a non-traditional, but synergistic way. The program permits Labs scientists and engineers to terminate their employment for up to two years, with a third-year option, in order to start up new technology companies or to help expand existing companies. These entrepreneur scientist/engineers are guaranteed reinstatement by Sandia if they choose to return to the Labs before the ESTT expiration period. ESTT's success metrics are remarkable. Here are just a few:

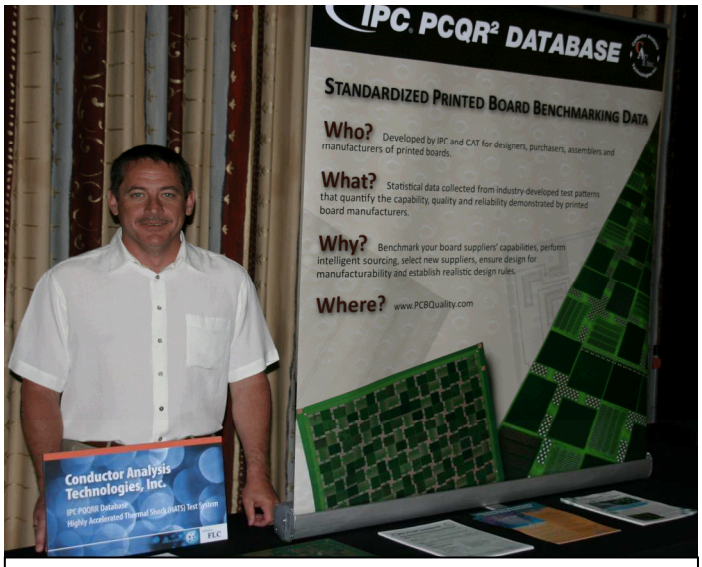
- Since ESTT began, 139 employees have participated. Fifty-six have left to start 44 new companies. Eighty-three left to help expand 47 companies. To date, 96 have terminated their Labs' employment to remain with their new companies, 40 have returned to Sandia during their ESTT period, and 3 are currently on ESTT.
- Venture funding attracted by ESTT start-up companies has surpassed $315M.
- ESTT start ups have generated more than 3600 jobs.
- Twenty-six ESTT companies have performed over $394M in contracts as suppliers to Sandia.
- Licenses for Sandia intellectual property negotiated with ESTT companies total 42.
- In the past 10 years there have been 18 ESTT start-up companies. Today, 15 – or 83 percent – are still thriving, an impressive survivability rate for any economy.

Simply put, ESTT is a stellar example – and the most prolific and long-running example within the DOE complex – of a pioneering approach to technology transfer that yields, in exemplary terms, what the National Competitiveness Technology Transfer Act of 1989 requires of its laboratories.

Criteria Part A –Background and Technology Transfer Process

Description of Technology and Transfer (30 points)

In order to properly address this category, it is necessary to take a look at some companies that have either been created or grown because of Sandia employees' decisions to participate in the Labs' ESTT program. These companies have benefited from the transfer of Sandia-developed intellectual property via licenses, or from the transfer of unique expertise developed by the entrepreneurs while employed by Sandia. Some ESTT companies, once started up or expanded, have engaged with the Labs through other tech transfer tools, such as CRADAs and WFO agreements.



Tim Estes, Sandia's first ESTT entrepreneur, shown at the International IP Day reception during the national FLC meeting held in Albuquerque, April 2010.

Former Sandian Tim Estes founded the first ESTT company, Conductor Analysis Technologies, in 1994. Still in business, it is a global provider of market-critical data for printed circuit boards, utilizing a set of tools developed at Sandia to measure conductor formation capability.

Tom Brennan left Sandia in 1996 to found MODE (MicroOptical Devices, Inc.), which commercialized products from IP licensed from Sandia, based on the Labs' VCSEL (Vertical Cavity Surface Emitting Lasers) technology. MODE subsequently was acquired by Emcore, a provider of compound semiconductor-based products, employing more than 350. Emcore moved its corporate headquarters from New Jersey to the Sandia Science & Technology Park (SS&TT) in 1997. Also, Hong Q. Hou left Sandia through ESTT in 1998 with his unique expertise to create a new product line for Emcore. Today he is the company's CEO.

eSolar, a Pasadena, CA-based start-up expanded when it gained a uniquely qualified Sandia ESTT entrepreneur, James Pacheco, in 2008, who brought with him one-of-a-kind expertise in concentrating solar power. eSolar is partnering with NRG Energy to build a 92-megawatt concentrating solar power plant in southern New Mexico, the largest such project in the U.S. It will be followed by a second 92-megawatt plant in California.

These few examples illustrate that the technologies transferred over the years of ESTT operation have been a cornucopia of people, their ideas and concepts, their entrepreneurial spirit, and of course their prototype products, which have been commercialized. Recipients of technology transferred through ESTT seeding are as varied as a patchwork quilt.

Initiation of Technology Transfer Partnership (5 points)

It is fair to say that each of the 139 Sandia employees who have chosen an ESTT opportunity did so for different reasons and with different expectations concerning their futures and their roles during and after the ESTT period. But, there are some common threads. In most cases, the Sandia scientists/engineers recognize they have an

idea, have some basic research primed for applied work, or even a product in mind that is coupled with enough business acumen and entrepreneurial spirit to say, "I'm going to try it." Also, because technology transfer is a defined mission of the Labs and because the Labs designates ESTT as one of several prime corporate mechanisms to transfer technology to the private sector, it is the responsibility of members of the Labs' management team to keep their staff members informed about ESTT.

Finally, it is the expectation of any ESTT partner company that a new technology or product will be developed, tested to proof, and commercialized. The expectation of ESTT partner companies is to "succeed as a business, create jobs, and enhance quality of life."

Technology Transfer Processes and Innovations Used (5 points)

A Sandia Corporate Procedure specific to ESTT reads in part: *"ESTT is one of the vehicles Sandia uses to support DOE's technology transfer mission. The intent ESTT is to provide entrepreneurship as a viable mechanism for maturing certain Sandia technologies into commercial products that benefit national security and prosperity. If a license to use Sandia intellectual property is necessary to operate the proposed business, participation will also depend on the development of a sound business plan and successful negotiation of license terms."*

Those who quality for ESTT participation must:

- *Seek to obtain a license from Sandia to patents or copyrights to start their new company,*
- *Seek to join an existing small company that is a Sandia licensee in order to provide technical support, or*
- *Seek to start or expand a small technology-based company using technical expertise specifically developed at Sandia that is unique and cannot be obtained outside of Sandia.*

The primary method – nearly 50 percent – of tech transfer throughout ESTT's history is licensing of intellectual property created by Labs scientists and engineers. However use of follow-on CRADAs, user facility and WFO agreements, and licenses also have all occurred.

Sandia provides no funds to ESTT over and above the salary for a Labs administrative staff member who devotes about 30 percent of his time as ESTT Project Lead. The Labs does provide a series of seven short training sessions for its employees who may be considering application into the ESTT program or who simply have an interest in entrepreneurial efforts. Offered three times a year, the course addresses the realities of entrepreneurship, markets and marketing, effective business plans, legal implications, and venture capital acquisition.

Time Frame Challenges (5 points)

Events that lead to a traditional-type of technology transfer event (examples provided in the "Basis for Nomination" section) flowing from an ESTT-enabled company and the amount of time involved for measurable tech-transfer success outside of the ESTT are equal. Some require weeks, some several months.

Patents (5 points)

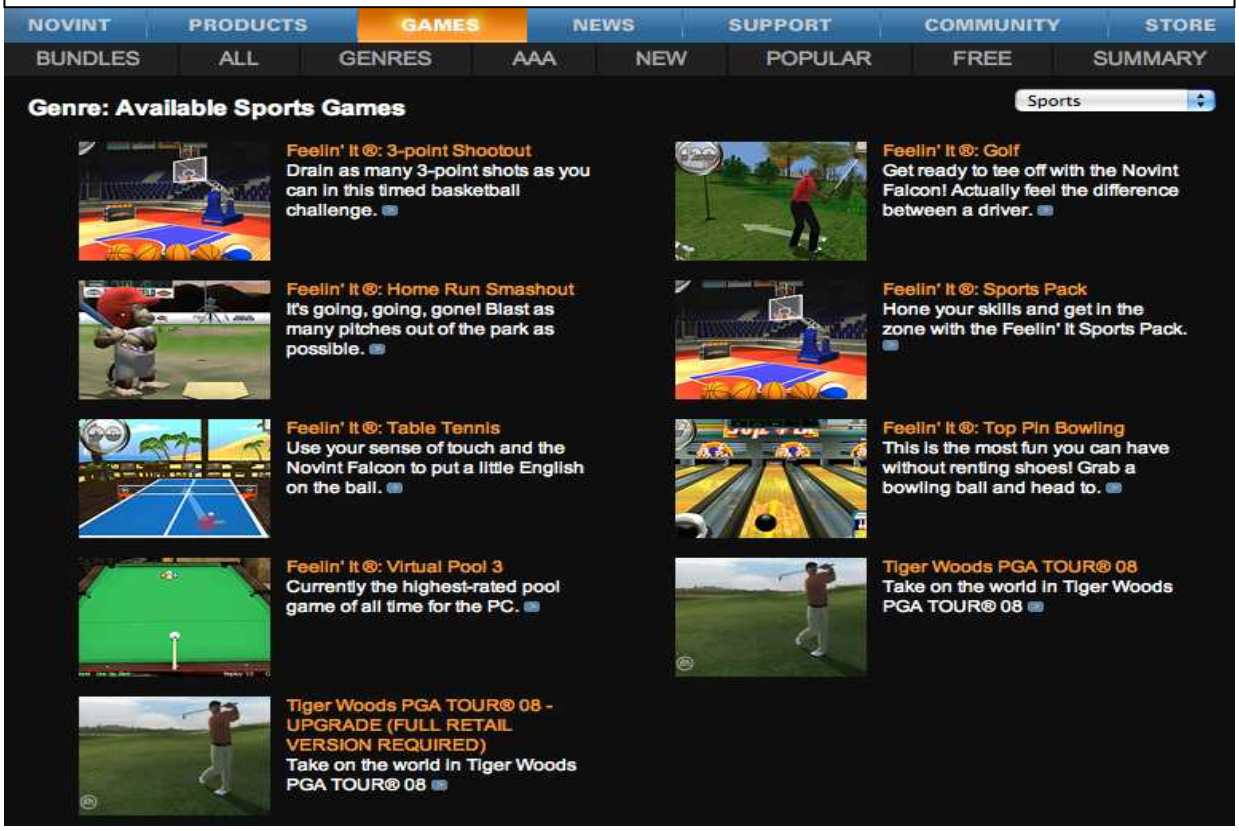
Since ESTT began, there have been 42 licenses of Sandia intellectual property issued to ESTT-facilitated companies. These have included mostly patents, but have also included some copyrights and trademarks.

Criteria Part B – Results

New Relationships Formed as the Result of the Transfer (5 points)

New relationships forged between Sandia and ESTT-enabled companies are many and varied. For example, Sandia has an equity share in Novint Technologies, an ESTT start-up established in 2000 and now publically traded (nvnt:otc US). It develops, markets, and sells 3D haptics products and equipment, applications, and technologies that allow people to use their sense of touch to interact with computers. The company offers Novint Falcon, a product that enables the consumer/user to navigate, in a 3D space, the game that they are seeing on the screen, and to feel the elements that they are seeing, including the textures, force, centrifugal force, and recoil.

From Novint's Web Site: Some Novint Falcon-supported modern-day popular computer games.



Other ESTT companies became suppliers to Sandia, such as Optomec Design, Ktech Corporation, and Emcore, which also is a CRADA partner. The Labs has established WFOs agreements with others, for example, eSolar.

Key to eSolar's technology is precise, automated calibration and control of thousands of their mass-produced sun-tracking heliostats, or solar reflectors.

"eSolar is proving that California's environmental leadership are advancing carbon-free, cost-effective energy that can be used around the world."
– Arnold Schwarzenegger, Governor of California

Outcome of the Technology Transfer Effort (45 points)

An effective way to illustrate the outcome of ESTT over its 16 years of existence is to offer a page from the most recent Sandia National Laboratories Partnerships Annual Report (FY2009).

ESTT

Entrepreneurial Separation to Transfer Technology

An economic impact study of ESTT start-up companies found that these companies created significantly higher paying jobs compared to overall average salaries in New Mexico and California.

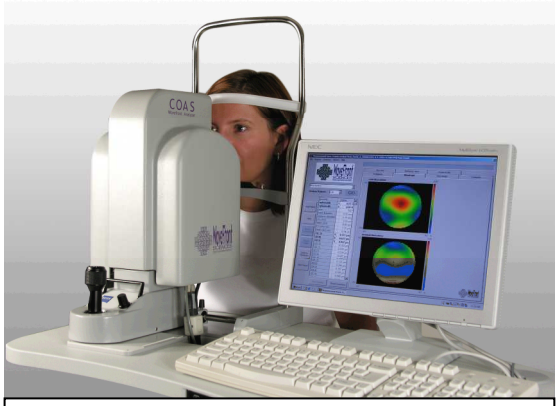
Entrepreneurial Separation to Transfer Technology (ESTT) Program

Sandia scientists and engineers who left on ESTT	138
To start up companies	55 (40%)
To expand companies	83 (60%)
Companies impacted by ESTT	91
Start-ups	44
Expansions	47
Licenses for Sandia IP negotiated with ESTT companies	42
ESTT companies that became Sandia suppliers	29
Economic impact of ESTT start-ups (16 respondents)	
Jobs directly created	277
In New Mexico	166
Outside New Mexico (CA)	111
Average salary - all 277 jobs	$60,556
Average salary - 166 NM jobs	$47,454
Average NM wage paid in 2007	$35,980
Average salary - 111 CA jobs	$80,150
Average CA wage paid in 2007	$50,182
Sales revenue of 16 companies in last FY	$22M
License fees paid to Sandia by ESTT companies in last FY	$242,500
Partnering with Technology Ventures Corporation (TVC)	
Joint clients of ESTT and TVC	35
Venture funding attracted by these 35 companies	$311M
Jobs created by these 35 companies	3,615
TVC funding events involving Sandia technology	42
Funding events for ESTT companies	28 (67%)

Note: Program began in 1994

Here are some additional examples of ESTT success stories. It is clear ESTT startups or companies that have grown and become successful because of input from this Sandia program have generated new industries, which have led to new and successful products. Other results of ESTT, which can be seen throughout this nomination, are positive impact on the economies and workforce statistics of communities where these companies operate, improved health and safety, and environmental benefits.

- ESTT-expanded TEAM Technologies, Inc., located in the SS&TP, is listed as one of Sandia's few "strategic suppliers," and is licensing Labs' technology. In January, 2010, TEAM Technologies' signed a license to make and sell Sandia's Stingray, the first fluid blade disablement tool that can be used by U.S. troops to neutralize improvised explosive devices and other explosives used against the troops. Stingray units will be in the hands of several thousand troops stationed in ongoing theaters of operation by August 2010. Stingray is a true life-saving device.
- Former Sandian Dan Neal founded Wavefront Sciences in 1996 with three licenses of Sandia technology related to wavefront sensor and binary optics technology. Wavefront grew from three employees to more than 40 and is now part of Abbott Medical Optics, a division of global, broad-based Abbott Laboratories, which markets in over 130 countries and employs over 72,000 people.



Wavefront's COAS (Complete Ophthalmic Analysis System) is the world's highest resolution wavefront aberrometer.

- Randy Normann left Sandia in 2008 to start up a company called Perma Tools, now Perma Works. Its product line is based on a license of a Sandia patent and copyright, along with two DOE-approved assignments of technical advances, all related to high temperature electronics. The company develops and manufactures high-temperature electronics tools - Enhanced Geothermal Systems (EGS) - for drilling in the oil, natural gas, and geothermal industries. Perma Works mission is based on the vast untapped potential of all forms of energy that aren't being exploited due to high temperatures. The company believes EGS can contribute significantly in making energy independence a near-term reality.