

THE 2009 FLC MID-CONTINENT REGION ANNUAL AWARDS SAND2009-4400P
Nomination Form

Please note the specific criteria for the nominated award.

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

- | | |
|---|--|
| <input type="checkbox"/> Regional Laboratory Award | <input checked="" type="checkbox"/> <u>Regional Partnership Award</u> |
| <input type="checkbox"/> Representative of the Year Award | <input type="checkbox"/> Outstanding Service Award |
| <input type="checkbox"/> Notable Technology Development Award | <input type="checkbox"/> Excellence in Technology Transfer |

DESCRIPTIVE TITLE OF NOMINATED REGIONAL PARTNERSHIP

New Mexico Small Business Assistance Program

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Nominee's Name: Genaro Montoya

Affiliation: Sandia National Laboratories

NOTE: Although this nomination is being submitted by Sandia National Laboratories, it is a joint program and joint nomination for Sandia National Laboratories and Los Alamos National Laboratory. It recognizes our partner, the State of New Mexico, a nonfederal entity.

Lab Director/CEO or POC: Thomas O. Hunter

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BASIS FOR THE NOMINATION

Small businesses, particularly in rural counties, often run into technical problems for which there is no assistance available in the private sector at reasonable cost. To help these companies, the New Mexico State Legislature created the Laboratory Partnership with Small Business Tax Credit Act, for the purpose of "bringing the technology and expertise of the national laboratories to small businesses in the state, with an emphasis on rural areas." This Act established the **New Mexico Small Business Assistance (NMSBA) Program** in 2000 to help small businesses throughout the state by providing technical support from Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL). Therefore, the NMSBA Program is a Regional Partnership between the State of New Mexico, Los Alamos National Laboratory, Sandia National Laboratories, and the private sector small businesses served.

At the request of the State of New Mexico and included in the legislation which created the NMSBA Program, the NMSBA Program is a joint program between the two national laboratories, Los Alamos and Sandia. There is a common website to advertise the program, a shared database to manage the clients, one annual report highlighting the results of the program, and there are common contracts and procedures to administer the program.

The NMSBA Program is truly unique within the national/federal laboratory system, but it could be replicated. How it works is this—Los Alamos and Sandia National Laboratories provide technical expertise to small businesses in New Mexico in exchange for receiving gross receipts tax credits from the State of New Mexico. So Los Alamos and Sandia National Laboratories pay less gross receipts tax to the State of New Mexico each year, the small businesses get technical support to solve problems, and the State of New Mexico gets more tax base through increased jobs and revenues at the companies.

Since its inception nine years ago, the NMSBA Program has assisted 1,455 small businesses in all corners of the state for a total value of \$16,398,044. With a concentrated effort to reach energy and agricultural businesses in underserved counties along the eastern and western borders of the state, 65% of these projects have been in rural areas.

An independent company conducts annual surveys of NMSBA Program participants after the completion of their projects. Since the start of the Program, 568 jobs have been created at an annual salary of \$39,406, leading to an increase in revenue of \$12,572,700, a reduction in operating costs of \$7,561,900, and an additional investment in other New Mexico goods and services of \$5,750,870.

In 2008, the NMSBA Program achieved record levels. In just one year, the two laboratories provided \$3.3 million in assistances to 286 companies throughout New Mexico. These projects provided cutting-edge scientific and engineering expertise, helping the businesses bring new products to market, troubleshoot existing processes, maintain or expand their work forces, reduce operating costs, and increase profitability.

Here are some examples and highlights of the NMSBA Program in 2008:

Developing a geothermal heating system—The hot water for the Giggling Springs spa comes free, from an underground spring. But the propane for heating their cabins was costing too much, and venting CO₂. The company asked Rich Jepsen, a SNL specialist in fluid- and thermo-dynamics, to design a heat exchange system using the geothermal water to heat the cabins without lowering temperatures in the pool. His system shrank their winter propane costs by two-thirds, reducing their carbon footprint and allowing the company to direct heat just to the cabins in use.

Reducing electricity interruptions and costs—In manufacturing bare, tin-plated, and insulated conductors for industries in North and Central America, Ffhoenix Cuivre was facing frequent power outages and high electricity bills, because their process often led to spikes in power usage. The delays and costs meant they had trouble meeting delivery dates and maintaining competitive prices. Loren Toole and his Energy and Infrastructure Analysis team at LANL analyzed the major equipment and daily patterns of power use, then used advanced modeling techniques to spot ways to modify the manufacturing processes to lower peak demand and raise average demand. Implementing the first action item, the company qualified for lower electricity rates, saving \$5,000 a month. As it acts on the other recommendations, the company anticipates potential savings of \$40,000 a month in electricity costs, and up to \$5,000 a month on maintenance costs, so prices can be kept low. And by eliminating shutdowns, the company can now meet its delivery dates.

Treating water— The process of extracting natural gas from coal beds often produces a lot of brackish and highly saline water—over 3 billion barrels a year from production sites in the Rocky Mountain region. That “produced water” cannot be poured out on the ground, because it would kill plants and foul nearby drinking water, so industry pays from \$1 to \$5 per barrel to transport and dispose of this water. To desalinate the produced water, a company called Biosphere Environmental Science and Technologies (B.E.S.T.) was designing a reverse osmosis system, but chemical and minerals in the water were reducing the effectiveness of the filtration membranes.

Allan Sattler and Malynda Cappelle of SNL worked with B.E.S.T and three other companies to develop and test a new pretreatment and reverse osmosis system, reducing the costs to \$3-10 per thousand gallons. New Mexico State University is now evaluating the use of this treated water for re-vegetating well sites with native plants, reducing the need for transport and disposal elsewhere.

Troubleshooting a plasma process— The EMC2 Fusion Development Corporation is working on creating radiation-free, cost-effective fusion power. But they hit an impasse. A device failed, and the plasma arced and lost confinement. Glen Wurden from LANL used high-speed cameras to photograph a fusion reaction, so that the company could visualize the dynamics of the device failure and spot the technical flaw in only two weeks. That saved the company six

months to a year in development, and about 30% of their annual budget. They can now continue with plans to hire two more employees this year, and five next year.

Modeling water usage—Farmers in the Nambé Pueblo rely on a centuries-old system of interconnected ditches, known as acequia, to irrigate their crops. They share the expenses involved in maintaining the ditches, and working cooperatively to determine how much water each farmer can use, and when. But new businesses and home owners are also tapping into the water that supplies the ditches, and everyone worries about what will happen to water supplies when more people move into the area.

Jim Brainard of SNL built a computer model of the entire system, so that the farmers could analyze the impact of decisions. What if they improved the main ditch? What if they improved the way water flowed into and through the fields? What if the population declines? The model lets the farmers identify the most cost-effective and efficient ways to manage the water and invest in infrastructure. The data from the model also allows them to apply for a tax credit targeted at conserving water in agriculture. That tax credit will offset the cost of future improvements to the ditch network.

Conclusion

We are nominating the New Mexico Small Business Assistance Program for the Regional Partnership Award because the Program has catalyzed the transfer of cutting-edge technology from two of our nation's leading national laboratories to a wide range of small businesses across thousands of square miles in New Mexico—all made possible through the legislation created by the State of New Mexico. This is a great example of a regional partnership, a regional partnership comprised of the State of New Mexico, Los Alamos National Laboratory, Sandia National Laboratories, and small businesses in the private sector.

Illustrations of NMSBA Success Stories 2008



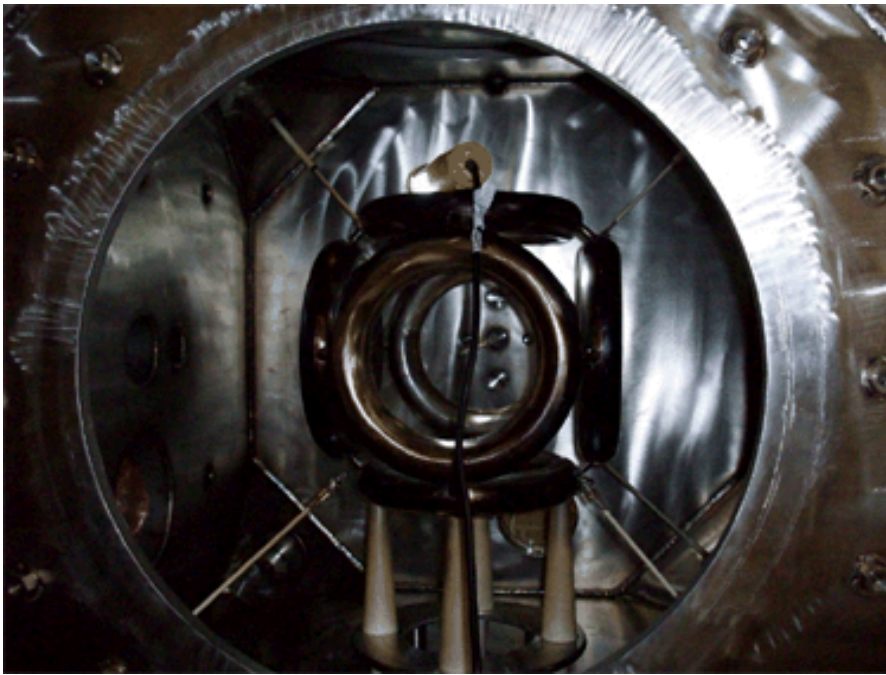
Developing a geothermal heating system—A SNL engineer designed a heat exchange system using the geothermal water to heat cabins at Giggling Springs Spa without lowering temperatures in the hot springs. The system shrank winter propane costs by two-thirds, reducing their carbon footprint.



Reducing electricity interruptions and costs—Phoenix Cuivre saved money and increased their on-time deliveries thanks to a LANL analysis of the major equipment within the plant, the plant's power demand, and the daily power-use patterns, as they manufacture copper wire.



Treating water—SNL worked with four companies to develop and test a new pretreatment and reverse osmosis system, overcoming problems with chemicals and minerals clogging filtration membranes, while reducing costs.



Troubleshooting a plasma process—

LANL engineers used high-speed cameras to photograph a fusion reaction, so that the small business, EMC2 Fusion Development Corporation, could spot the technical flaw in only two weeks, saving the company six months to a year in development, and about 30% of their annual budget.



Modeling water usage—SNL built a computer model of the entire water system for the Nambé Pueblo, so that a group of farmers could analyze the impact of decisions, identifying the most cost-effective and efficient ways to manage the water and invest in infrastructure.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.