SAND96-1969C
CONF-9609215--1

REDUCE OVERHEAD BY USING OUTSIDE SERVICES

Robert O. Sanchez

Sandia National Laboratories
Albuquerque, New Mexico

Introduction

In 1945, Sandia was a small part of Los Alamos Laboratory, called Z-Division, which provided technical support to the U.S. Army. In 1949, Harry Truman wrote to the President of AT&T to offer "an opportunity to render an exceptional service in the national interest" through management of Sandia Laboratories. After 46 years as a government-owned contractor-operated laboratory, Sandia continues to provide exceptional service in the national interest as one of the country's largest technical resources.

Today, Sandia is a multiprogram engineering and science laboratory operated by Sandia Corporation, a subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy (DOE). It's headquarters and main laboratory are located on Kirtland Air Force Base in Albuquerque New Mexico. Another Sandia Laboratory complex, in Livermore, California, was established in 1956 to provide a close working relationship with Lawrence Livermore National Laboratory. Test ranges are operational near Tonopah, Nevada, and on the island of Kauai, Hawaii.

Sandia employs more than 8,500 people; the majority are based in New Mexico. Some 1,050 employees work in California, and smaller groups work at Tonopah, Kauai, and the DOE Pantex Plant in Amarillo, Texas. Approximately 60 percent of the Lab's employees are in technical and scientific positions, and the remainder are technicians, craftsmen, skilled labor and administration. Sandia has major research and development responsibilities for nuclear weapons, arms control, energy, the environment, economic competitiveness, and other areas of importance to the needs of the nation. Our principle mission is to support national defense policies by ensuring that the nuclear weapon stockpile meets the highest standards of safety, reliability, security, use control, and military performance

Custom Magnetics Department

Department 1251, Custom Magnetics, Capacitors & Interconnections, a part of Center 1200, Electronic Components, within Division 1000, Electronics, Materials, & Components Engineering is committed to provide exceptional service to their customers in the area of design, development, qualification and documentation.

For over four decades, Sandia has designed developed and qualified highly reliable magnetic components for weapon system applications. Private industry can now leverage these years of R&D, supported by DOE policies that encourage the transfer of appropriate technologies to the private industry for commercialization.

Sandia offers a wide range of integrated services and capabilities including:

Design, Packaging, & Processes

- complete design capability for small, <500 cubic inches, magnetics

Sandia places particular emphasis on the use of environmentally safe materials and processes aimed at:

- reducing the generation of hazardous wastes
- eliminating health and environmental hazards while improving product quality and performance
- providing environmentally conscious manufacturing

Forty-six years of service designing, prototyping and testing magnetic components for the nation's nuclear weapons have led to Sandia's unique expertise in:

- design for severe environments
- complete encapsulation and impregnation
- stress analysis
- design for stress reduction
- design for audible noise reduction

This work was supported by the United States Department of Energy under Contract DE-AC04-94AL85000.

- material characterization
- material compatibility studies

Computer Modeling & Simulation
Advanced capabilities in computation modeling and simulation include:
- PSPICE, circuit analysis
- SABER, circuit analysis
- COSMOS/M finite element magnetic field & mechanical stress analysis

Reliability
- accelerated aging
- reliability analysis

Test Capabilities
The need for absolute safety and reliability in nuclear weapons components provides the basis for Sandia's state-of-the-art test apparatus. Much of the equipment has been designed and built at the laboratories and exists only at Sandia. Capabilities include:

Electrical
- complete electrical characterization
- frequency 5Hz to 1Ghz
- variety of inductance measurement equipment
- characterization at temperature
- high voltage testing
- BH loop

Environmental
- mechanical shock up to 30,000 G's
- vibration up to 150 G's
- vacuum to 10^{-7} torr
- thermal -74°C to 2,205°C
- radiation
- explosive up to 20 ton HE
- electro-magnetic
- acceleration up to 2000 G

Failure Analysis
Construction Analysis
Quality Management

Technology Transfer

Technology transfer, now referred to as Technology Partnership & Commercialization, at Sandia extends over three decades, and industry has produced several billion dollars' worth of products made possible by Sandia-developed technology. The National Competitiveness Technology Transfer Act of 1989 made technology transfer an official mission of the DOE laboratories and granted Sandia authority to enter into Cooperative Research and Development Agreements (CRADA) with universities, private industry, and other laboratories.

To date, Sandia has participated in hundreds of joint projects with U.S. industry. All of these collaborations have a dual objective: to promote American competitiveness in the world marketplace while also benefiting the Energy Department. Programs range from on-site technical assistance to full-fledged CRADAs. Two hundred eighty CRADAs worth approximately $700 million dollars in shared research and development efforts have been initiated with U.S. companies. A number of these cooperative agreements are with businesses in local communities.

When Vanguard Electronics, a California company that manufactures magnetic components, was faced with the requirements to comply with federal laws banning the use of ozone-depleting agents, Sandia National Laboratories helped by recommending a commercially available, environmentally-safe solvent which was tested by Sandia. When Roses Southwest Papers, a New Mexico company that supplies paper bags to McDonald's restaurants in 13 states, needed help with a gluing problem, Sandia National Laboratories helped the firm find a commercially available sensor that solved the problem and opened doors to even larger contracts. When a California startup company needed assistance with an interactive talking book to teach phonics and reading, Sandia helped design a manufacture-ready prototype.

At the other end of the spectrum, when Cummins Engine Co., a large corporation and leading manufacturer of diesel engines and generators, decided to expand it's product line by offering solar thermal power systems, a joint partnership with Sandia helped research and development get under way for a Cummins subsidiary.

Through efforts such as these, Sandia is helping businesses large and small to prosper and grow, from collaborating with Disney in ignition of pyrotechnics to helping a small manufacturer test environmentally friendly wood coatings.

Sandia participates in industrial consortia of companies with similar markets, such as automobile manufacturers, petroleum producers, or textile manufacturers. Other programs include technical referrals to Sandia researchers, use of Sandia facilities, licensing to move Sandia technologies into new products, business training

and workshops, and joint proposals to apply for federal funds through other programs, such as the Advanced Technology Program .managed by the department of Commerce.

Special assistance is available to small businesses. For example, small businesses are eligible for up to $5,000 worth of free technical assistance. A simplified form makes it easier for small companies without large legal staffs to participate in partnership agreements with Sandia; the company and Sandia each provide half the cost of the venture in staff time and in-kind services - Sandia's portion is supported by money set aside by the Department of Energy.

Technology Ventures Corporation, a nonprofit subsidiary of Lockheed Martin Corporation, is dedicated to working with the private sector to create spinoff enterprises using laboratory technologies, and also provides consulting on how to find funding for technology transfer projects. Another intermediary is the New Mexico Industry Network Corp., known as New Mexico INC.

Women and minorities, who own 38 percent of small businesses in America, are eligible for special assistance.

Providing science and technology for all stakeholders is an essential part of strengthening the economy and security of the United States, and it is a key part of technology transfer at Sandia.

User Facilities

Sandia encourages cooperative research and development activities between the labs and industry, university and other government entities. Many laboratory facilities are available for such cooperative work. There are three officially designated user facilities: the Combustion research facility, Sandia California; the National Solar Thermal Test Facility, Sandia/New Mexico; and the Electrical Quality and Reliability Center, Sandia/New Mexico. Other facilities offer research capabilities to support industry in specific areas.

The Combustion Research Facility comprises twenty individual laboratories with projects ranging from fundamental studies of combustion-generated pollutants to applied studies of processes in internal combustion engines.

The National Solar Thermal Test Facility is a major facility for studies involving high-intensity heat that includes two 10.8 meter diameter parabolic dishes, two solar furnaces, four line-focus parabolic trough systems, and a central tower facility with a heliostat field.

The Electronics Quality and Reliability Center has two main laboratories that specialize in quality and reliability analysis, product characterization and benchmarking, and a failure analysis for electronic and microelectronic products, prototypes, processes, and designs.

Other user research facilities include

- Battery Dry Rooms and Prototype Fabrication Laboratories
- Battery Test and Evaluation Laboratories
- Burner Engineering Research Laboratory
- Center for Computer-Aided Molecular Design
- Component Modeling and Characterization User Facility
- Cryogenic Device Characterization Lab
- Engineering Services Center
- Green Manufacturing
- Integrated Manufacturing Technologies Laboratory
- Intelligent Systems and Robotics Center
- Optical Properties Characterization Lab
- Photovoltaic Laboratories
- Vertical-Axis Wind Turbine Test Bed
- Wellbore Hydraulics Flow Facility

For More Information:

Sandia National Laboratories
PO Box 5800

Technology Partnership & Commercialization Department
(505) 843-4164 • Mail Stop 1380
Net address (http://www.sandia.gov /ttrans/ttrans.html)

Custom Magnetics, Capacitors, & Interconnections Department
(505) 844-5040 • Mail Stop 0523

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2. Sandia National Laboratoties, general information summary, dated 1994