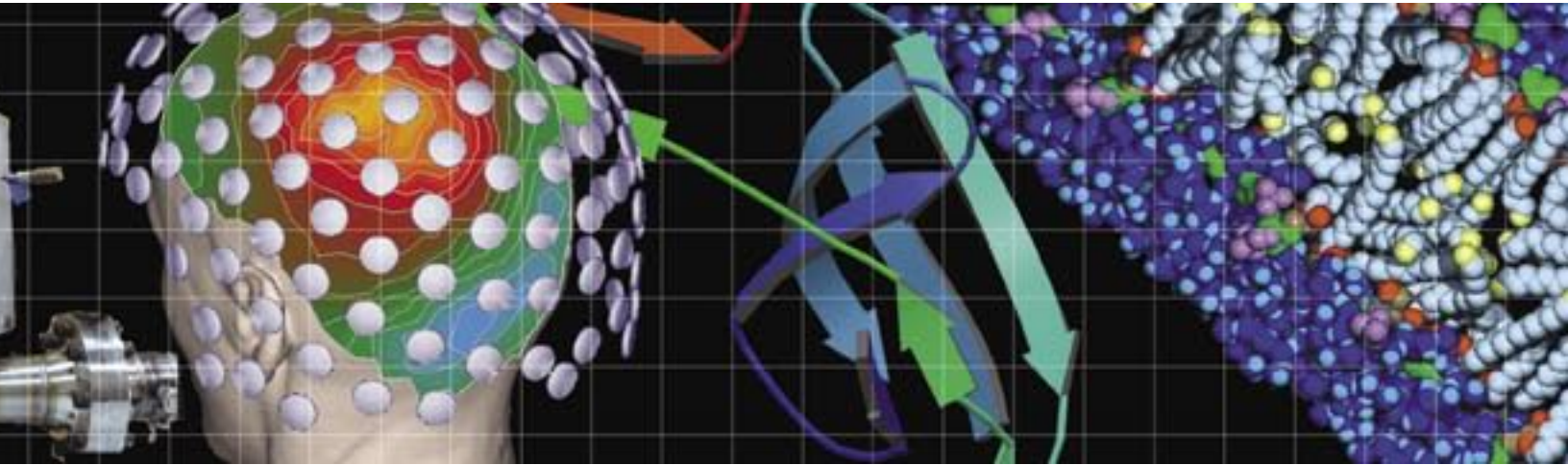


Industrial Business Development

2003 Progress Report



The World's Greatest Science Protecting America



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Los Alamos National Laboratory—A National Resource



Los Alamos National Laboratory, a Department of Energy laboratory, managed by the University of California, is one of the largest multidisciplinary research institutions in the world. The Laboratory is the largest institution and the largest employer in northern New Mexico, with approximately 7,500 University of California employees plus 3,200 contractor personnel. The Laboratory's annual budget is about \$2 billion.

Approximately one-third of the Laboratory's technical staff members are physicists, one-fourth are engineers, one-sixth are chemists and materials scientists, and the remainder work in mathematics and computational science, biological science, geoscience, and other scientific disciplines. Professional scientists and students come to Los Alamos from all over the world as visitors to participate in scientific projects. Laboratory staff collaborate with universities and industry in both basic and applied research to develop resources for the future and to achieve the Laboratory's mission of applying the best science and technology to make the world a better and safer place. The Laboratory is well known as a major national resource for the development and integration of leading-edge science and technology to solve problems of national and global security.



A Message from the Industrial Business Development Division Leader

The Industrial Business Development (IBD) Division continued in 2003 to contribute to the Laboratory mission and success through a number of programs to identify and transfer technology to new and existing businesses outside the Laboratory and to develop collaborations and research projects to support that mission. We focused our efforts on

- managing the Laboratory's intellectual property through patents and copyrights and executing licenses and partnership agreements;
- building and maintaining strong strategic partnerships with private industry; and
- nurturing new high-tech businesses and attracting entrepreneurs and capital to northern New Mexico.



Donna M. Smith, Division Leader

Organizational highlights for 2003 include the following:

- One hundred eighty active commercial licenses under management: Since its inception in 1988, the Licensing Program has generated more than \$8.5 million in revenue to the Laboratory with over \$3 million returned to the inventors.
- Eight R&D100 Award-winning technologies demonstrating the commercial potential and innovation represented by Laboratory technologies.
- One hundred collaborative and sponsored-research agreements with industry and other outside entities under active management.
- Two new strategic partners, Itochu of Japan, the world's 17th largest company, and 3M, which contributed over \$5 million in equipment and expertise to the Laboratory's High Temperature Superconductivity program.
- Active engagement with and support from our External Advisory Board.

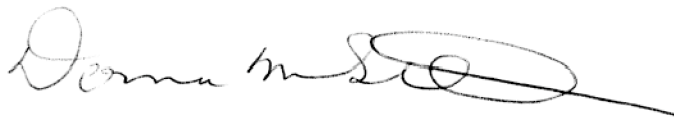
In response to the 2003 External Advisory Board recommendations, IBD performed a detailed workforce review and assessment of its strategic direction. This effort integrates with the new Laboratory planning and execution initiatives and provides direction for future activities and programs.

The Laboratory's strong commitment to economic development and diversification continued in 2003 through a number of programs.

- Director G. Peter Nanos articulated his personal commitment to the communities and regional businesses to support diversification efforts.
- The Laboratory partnered with the State of New Mexico, several businesses, and economic development organizations to assess the potential for development of a cluster based on hydrogen and fuel cell technologies. Ken Freese from IBD participated in an assignment with the New Mexico Economic Development Department to implement the Hydrogen Technology Partnership (HyTeP) to pursue this program. In addition, the Laboratory participated in the state's definition and implementation of a cluster based on digital media and made advances in digital processing of various types of images, such as video and scientific data.

- During the year the Laboratory also actively participated in the Technology Research Corridor Collaborative, an initiative by the state's research universities, national laboratories and R&D-focused companies to identify and leverage research for further economic development. New collaborations and research opportunities have already emerged from this effort and the institutions are in the early stages of identifying new economic development opportunities.

While the Laboratory is experiencing a number of dramatic changes in its business operations and seeks new opportunities to streamline operations, trim costs, and improve business operations, IBD continues to be a strong, mission-focused organization. IBD staff have contributed their business expertise and industry contacts to lead or participate in a number of Laboratory improvement initiatives. We look forward to a challenging and exciting 2004 as IBD and the Laboratory address the future.

A handwritten signature in black ink, appearing to read "Donna M. Smith". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Donna M. Smith
Division Leader
Industrial Business Development Division

Overview of Technology Transfer at Los Alamos National Laboratory

With the passage of the Bayh-Dole and Stevenson-Wydler Acts of 1980, federally funded research and development (R&D) organizations received a congressional mandate to transfer their technology innovations out of the government labs to the private sector for the enhancement of U.S. economic competitiveness. By the early 1990s, tech transfer was beginning to gain a foothold within the government-industrial complex. Tech transfer flourished briefly in the mid to late 1990s with the impetus of government agency sponsorship such as the Department of Energy's (DOE) Defense Programs Technology Transfer Initiative and Technology Partnership Programs. However, despite passage of the Technology Transfer Commercialization Act of 2000, with the demise of some of the federally sponsored programs, the tech transfer effort was thrust into a sea of political tides and economic whitecaps. The blossoming and wilting of the dot-com industry during the first years of the new millennium played havoc with venture investment funds and industry risk taking. Today, the erosion of the U.S. manufacturing base and the loss of many traditional employment opportunities make it more imperative than ever before in our nation's history for us to recognize that the keys to solving technological problems that impact global security reside in our ability to communicate and collaborate with other institutions—institutions whose capabilities and expertise intersect with and expand the unique capabilities available in a place like Los Alamos National Laboratory (LANL).

The primary role of the Industrial Business Development Division is to serve as the Laboratory's link for the transfer of LANL technologies to the private sector through productive collaborations with private industry, universities, other government agencies, and other national laboratories. When we orchestrate successful matches of our scientific and technical talent, expertise, and facilities with R&D endeavors in external sectors for the advancement of national security, technological innovation, and economic competitiveness, we reinforce our role as a vital part of the institution and enhance DOE's effort to transfer technologies from its laboratories to the private sector.

The partnerships we develop and foster serve to enhance the dissemination of the scientific research and technology developed at the Laboratory.

Protecting the Laboratory's Intellectual Property

We work closely with the Laboratory Counsel's Intellectual Property Office (LC-IPO) to manage and protect LANL's intellectual property, thereby enabling the transfer of new and emerging technologies from the Lab to private industry. Through our licensing activities, we help move technologies into the marketplace, benefiting society and the U.S. economy. Such activities also help to stimulate regional business development by encouraging the commercialization of Laboratory technologies through spinoff, high-tech, startup businesses.

Accessibility

IBD maintains an open, easily accessible presence on the Laboratory's Web site to keep both Laboratory staff and external customers informed about technology licensing opportunities, mechanisms for partnering with the Laboratory, and related technology commercialization opportunities and resources. We provide detailed information and online forms to assist Laboratory staff with their efforts to understand and comply with the policies and procedures they must follow to patent and copyright Laboratory technologies. By providing clear, concise instructions to Laboratory innovators and authors, we facilitate the protection of the Laboratory's wealth of intellectual property so that it can be effectively and efficiently transferred to the private sector for the benefit of all.

Our staff includes experts in technology transfer agreements, intellectual property protection, and all aspects of technology commercialization including licensing, marketing, entrepreneurial activities, and regional economic development. Our goal is to establish dual-benefit collaborations that meet the needs of both the Laboratory and its partners.



Los Alamos Electrochromic windows combine durability, high-performance, and inexpensive manufacturing, and could reduce U.S. energy consumption by 5%.

Licensing Announcement

Electrotint Windows

Modern glass and steel buildings act as giant greenhouses. Keeping these office buildings comfortably cool, particularly during the spring and summer months, can be a daunting task. Electrochromic windows, developed by LANL in collaboration with a small southwestern company, can quickly go from a colorless to a deeply colored—or mirrored—state and back again. Electrochromic windows are designed to let in 75% of visible light during fall and winter and block 90% of light during spring and summer. The proprietary dyes and chemical formulations used in Electrochromic windows and mirrors do not rely on hazardous chemicals and will not degrade, swell, break down seals, or evaporate—problems that are common to conventional electrochromic windows.

Electrochromic formulations integrate easily into modern architectural and vehicular designs and manufacturing processes and are cost effective compared with solid-state electrochromic windows.

Applications

- Energy-efficient building windows—optimizing heat gains and losses through windows and enhancing the use of daylight could reduce U.S. energy consumption annually by up to 5%.
- Rear- and side-view vehicle mirrors—elimination of headlight glare that has been shown to reduce automotive accidents.

The Electrochromic technology has been licensed by ElectroChromIX, Inc. of Tucson, AZ, and is expected to reach the commercial market within the 2004–2005 time frame.

Licensing Success Stories

PowerFactorE—PowerFactorE is a suite of reliability engineering tools designed to optimize manufacturing processes. The result of a collaboration between the Laboratory and Procter & Gamble (P&G), it comprises a unique set of methods, statistical and analytical tools, simulation software, procedures, and training that enable manufacturing line managers to understand reliability losses and to correct seemingly isolated, yet very costly, defects in the manufacturing process. The relationship began with Procter and Gamble in 1995 under a cooperative research and development agreement (CRADA). This CRADA, together with others, resulted in the PowerFactorE technology, a development that bumped up P&G's manufacturing productivity more than 44% and gave LANL an abundance of real time data to use for testing its predictive capabilities. With a license from LANL covering patents that protect the PowerFactorE technology, P&G has partnered with BearingPoint to customize and license this product to other manufacturing entities allowing them to reap benefits similar to what P&G has realized through its applications of the product. In 2003, the PowerFactorE technology won an R&D 100 Award, bringing the Laboratory's total to eight for the year.

Radion Technologies—In October 2002, Radion Technologies (originally known as Radiative Solutions) spun off from LANL with a nonexclusive license for the Laboratory-developed Attila software, a numerical modeling and simulation code used for radiation transport analyses. The Attila software product performs calculations necessary for modeling neutron, photon, or charged-particle behavior. These calculations find utility across many applications including nuclear power, medical imaging, cancer therapy, radiation safety, satellite shielding, spent fuel storage and disposal, and nuclear oil-well logging. Radion Technologies, whose founders took Entrepreneurial Leave of Absence from their Laboratory jobs to commercialize the technology, is currently housed in the Los Alamos Research Park.

Strategic Partnerships

The Industrial Business Development Strategic Partnerships (IBD-SP) Program continued to develop technology transfer projects with new and existing partners during FY 2003. Initiated in 1999, the IBD-SP Program sought to identify and develop industrial partnerships that create strategic advantages for both the Laboratory and its industry partners and to cultivate opportunities for bi-directional technology transfer and sponsored research in strategic technology focus areas. New collaborations with strategic partners provided over \$9 million in value to the Laboratory and its programs in FY 2003. IBD-SP also negotiated a donation of equipment to the Laboratory valued at \$5 million. We look forward to the continued growth and development of strategic partnerships during the coming year and expect to see increasing value to the Laboratory accruing from these important relationships.



Ken Freese, Program Manager

The Laboratory needs strategic partners in industry to complement its science and technology capabilities and to commercialize the results of its R&D. The IBD-SP Office has worked to develop partnerships with companies built on mutual trust, common goals, and shared risk. Through these partnerships we seek to achieve goals that may be difficult or impossible for either party to accomplish alone. The partnerships are designed to benefit all parties while ensuring the necessary technological capabilities to assist the Laboratory in meeting its programmatic responsibilities. Partnerships that are considered “strategic” are generally broad-based and long-term and have strong support from senior management on both sides. While IBD-SP was eager to assist all programs at the Laboratory with the development of strategic partnerships with industry, we concentrated on two areas perceived to have immediate need and high potential for strong industry participation: the High Temperature Superconductivity Program and the Center for Homeland Security. We will continue to work with both of these programs, in addition to others, to develop strategy for commercialization of technologies and to identify and qualify potential industrial partners.

During FY 2003, IBD-SP maintained ongoing relationships with existing strategic partners and explored new relationships with 17 additional companies. IBD-SP actively sought opportunities for collaborative research and development (R&D) and licensing, hosting 50 meetings and visits with companies during the year. A recent example of the development of a new strategic relationship with a company is the Laboratory’s partnership with the Itochu Corporation.

New Strategic Partnership

Itochu Corporation—In October 2002, a Memorandum of Understanding (MOU) was signed by the Laboratory and Itochu Corporation to explore the benefits of a strategic relationship between the two parties. Various technology areas were identified that were of interest to Itochu in Japan, the U.S., and worldwide. With Itochu being the 17th largest company in the world with interests in most technical areas, finding the right technologies to pursue first became the challenge. After more than a year of interaction with Itochu, which included six visits by Itochu to LANL, one visit to Japan by LANL, and considerable correspondence, the initial technologies for collaboration were identified.

By the end of 2003, a license was under negotiation as well as a specific MOU to address the technology area that will be the subject of a cooperative research and development agreement (CRADA) with Itochu. A senior researcher has been invited to visit Japan during 2004 to examine firsthand the challenges he will face during the upcoming CRADA collaboration. Additional opportunities have been identified with New Mexico startups and spinouts from LANL. Itochu has kept us informed about its latest endeavors to identify and assist spinouts from LANL.

All in all, the year ahead should be quite exciting and fruitful for both parties.

Ongoing Relationships

Strategic partnerships, by their nature, generally take time to develop. For example, the Laboratory has been working with Procter & Gamble and Motorola for more than a decade, developing both experience and trust in these relationships.

The Procter & Gamble (P&G)/LANL Partnership—At the start of FY 2003, the Laboratory entered its second decade in partnership with P&G, one of the top 20 R&D investors among U.S.-based industrial research organizations. What began with a single project designed to develop a reliability prediction model to streamline P&G's manufacturing efficiency has turned into much more. Software resulting from this project was licensed to P&G. The resulting product, PowerFactoRE, is currently implemented in all of P&G's more than 200 manufacturing plants worldwide saving the company in excess of \$1 billion to date. Recently, P&G sublicensed PowerFactoRE to BearingPoint (formerly KPMG Consulting), one of the world's most respected business advisors and systems' integrators. In 2003, PowerFactoRE won a prestigious R&D 100 Award as one of the 100 most significant technological advancements worldwide to reach commercialization during the past year. For many reasons, the P&G/LANL relationship is truly a strategic partnership that is mutually beneficial and crosses multiple divisions in both institutions.

The partnership has evolved to comprise five projects under one master CRADA. To date, collaborations with P&G are ongoing in areas of statistical tools and knowledge integration, bioinformatics, multi-fluid simulation, materials modeling, and sensors. In 2003, the success of a two-year LANL Industrial Fellow assignment to P&G transitioned into another two-year assignment. The new Fellow will continue to serve as a liaison to scout and secure further technical collaborations that benefit both institutions. In addition to collaborations, technical relationships led to technical and business exchanges on a variety of topics ranging from "business practices," presented to LANL's Senior Executive Team Management Retreat by P&G's Tom Lange, to specific areas such as sensors, polymers, and modeling. As the Laboratory's relationship with P&G continues to grow, opportunities for collaborative R&D and technology commercialization proliferate.

The Motorola/LANL Partnership—The working relationship between Motorola and the Laboratory began a decade ago with a single project in the area of modeling and simulation of semiconductor processing technologies. Two projects continue in this area. As the partnership expanded into other research areas, such as enterprise modeling, image processing, and fuel cell technologies, it has shown clear benefit to the Laboratory's threat reduction, energy, and weapons programs. In addition, Motorola has become a participant in the Laboratory's Russian Cities Initiative.

During FY 2000, one of the positive results of the strategic relationship between the Laboratory and Motorola was the company's commitment to occupy 11,000 square feet within the newly constructed Los Alamos Research Park. The Laboratory, DOE, and the Los Alamos Commerce and Development Corporation (LACDC) are jointly developing

this project with support from the County of Los Alamos. During 2003, a sluggish economy forced Motorola to close its offices at the Research Park. However, collaborations between Laboratory and Motorola researchers remain strong despite the reduction of Motorola's presence in Los Alamos.

In FY 2003, a major new initiative was launched. Motorola and the Laboratory began a collaboration to benefit the Lab's Structural Health Monitoring project, a major program within the weapons arena. Motorola brings expertise in self-assembling communication networks to the table to complement the Lab's expertise in sensor development and data acquisition and analysis. A collaboration in unattended monitoring and data communication for concerns such as wildfire and pipeline safety relevant to the Laboratory's Threat Reduction Programs is under discussion. This collaboration would use Motorola's ACORN system developed for precision agricultural applications. We also anticipate a collaboration on monitoring conditions relevant to plant disease that would use this same system. Continuing through most of FY 2003, the Laboratory had an Industrial Fellow assigned to Motorola to develop additional ways to strengthen the partnership with the Laboratory.

Partnership with PPG Industries—Los Alamos concluded its eight-year Industrial Fellow relationship with PPG during FY 2003. A renewal of the partnership may be explored in future years, depending upon the needs of each institution and the state of the economy.

Partnership with 3M Corporation—In FY 2003, the Laboratory and 3M Corporation negotiated a donation of a materials evaporation and deposition system to the Laboratory's High Temperature Superconductivity (HTS) Program. 3M, an industrial research partner with the HTS program, no longer needed the equipment, an evaporator valued at \$5 million. This equipment provides significant additional capability to the Laboratory and the HTS program.

The Industrial Fellows Program



The Laboratory's Industrial Fellows Program assigns experienced Laboratory professionals to work with senior managers at a host company for at least one year and preferably longer. The Industrial Fellow assignment provides an ideal opportunity for Laboratory staff members

to work for carefully selected companies with the goal of building strategic technical alliances. Such alliances tend to evolve when researchers from very different backgrounds work together on projects of mutual interest. As noted above, during FY 2003, Laboratory Industrial Fellows were working with Motorola (Tempe, AZ), P&G (Cincinnati, OH), and PPG Industries (Pittsburgh, PA).



Los Alamos Research Park

The Laboratory, DOE, and LACDC, with support from the County of Los Alamos, are steering the development of the Los Alamos Research Park. IBD played a major role in negotiating the site lease and continues to coordinate Laboratory interactions with LACDC, manager of the park. The 44-acre park, located directly across from the Laboratory's main technical area, provides space for housing collaborative efforts among Los Alamos researchers and corporate, academic, and institutional research and development staff. Motorola and many other companies, the University of California, and members of the Laboratory's technical directorates have been tenants in the first of five planned buildings. Construction began in the spring of 2000; the first building was dedicated on March 24, 2001. Future expansion calls for a total of 300,000 square feet of office and light laboratory space for 1,500 researchers.

It is anticipated that by January 2004, Building 1 of the Los Alamos Research Park will be fully leased. IBD-SP was able to assist in recruiting two new tenants during 2003. This space absorption is well ahead of the initial projections for the Research Park. However, Motorola has physically moved out and is actively seeking a tenant for its space. The construction loans for Building 1 have been rolled over into permanent financing. Planning for the second building has begun. LACDC, the building owner, is developing a prospective tenant list for the second building and is working with LANL to house several programs that feature strong external collaborations.

Industry Forum—LACDC and IBD-SP cosponsor the Industrial Forum series at the Research Park. The Industrial Forum is a series of presentations that showcases the role of technology in product development and commercialization. The Forum brings together industry, LANL scientists and technologists, and the local investment community to discuss market opportunities that can be realized and challenges that need to be addressed through technology development. These forums provide the opportunity for networking with others interested in the topics presented and seek to demonstrate best practices in partnering and co-development.

The Forum draws speakers from leading local and national technology businesses. This year started off with a program on "Authentication Solutions: the Science Behind the Technologies." The speaker was Dale Spall, chief science officer of Isotag Technology Inc. (now Authentix). The series followed with "Modeling Where You Least Expect It: Use of Computer Aided Engineering in Everyday Products," presented by Tom Lange, chief technologist for modeling, simulation, and analysis at P&G. Finally, "Linux Clusters," was presented by Pete Savinelli, director of Linux cluster sales at IBM.

The Hydrogen Technology Partnership

During FY 2003, Ken Freese, the IBD-SP Program Manager, worked on assignment to the New Mexico Economic Development Department (EDD) to develop an economic development strategy to create a business cluster for hydrogen and fuel cell businesses in the state. Commercialization of hydrogen and fuel cell technologies is a major strategic focus of for the Laboratory, as well as working within the northern New Mexico region to stimulate the local economy. IBD played a leadership role in developing the New Mexico Hydrogen Technology Partnership (HyTeP), an alliance of public and private sector organizations seeking to position New Mexico to take economic advantage of the emerging global hydrogen economy. Together with HyTeP and New Mexico state agencies, IBD conducted an economic opportunity assessment for the hydrogen economy in New Mexico and developed a strategy to grow new and existing businesses in this cluster. The recommendations from this strategy became the elements of legislation developed by the New Mexico EDD and the Energy, Minerals, and Natural Resources Department that will be introduced in the 2004 legislative session. LANL will continue to participate as a member of HyTeP in the implementation of this strategy to build new businesses based on hydrogen and fuel cell technologies coming out of the Laboratory.

R&D 100 Awards Sponsorship

IBD-SP sponsors Laboratory participation in *R&D Magazine's* annual R&D 100 Awards competition by submitting the Laboratory's most innovative technologies available for commercialization during the past calendar year. The competition, which celebrated its 41st year during 2003, seeks technologically significant new products or processes developed by the international R&D community from across multiple industries, government agencies, and universities. Entries must represent technologies available for purchase or license in the year preceding entry. Entries are strengthened when private-sector interests, such as CRADA, joint venture, license or other contractual industrial arrangements exist. The R&D 100 Awards competition is the only worldwide competition that recognizes the practical applications of science.

Entries are submitted in open competition and judged by technical experts selected by the Chicago-based *R&D Magazine*. The magazine uses technical and commercial criteria to select the 100 most significant, unique, or promising entries from the nominated field. Projects span a diverse range of scientific and technical areas—from software, analytical instruments, energy systems and life science to materials, thin films, and nanotechnologies. The Laboratory has been competing since 1978 with many of its winning technologies developed in collaboration with private-sector companies

and other scientific institutions. In 2003, LANL won eight awards, more than any other competing government lab or agency, university, or company. To date, LANL has received 89 awards. Laboratory winners represented 10 technical divisions, one program office, and entries submitted jointly with Lawrence Livermore National Laboratory, the University of Hawaii, the U.S. Dept. of Agriculture Forest Service, Rocky Mountain Research Center, PyroLabs, Hytec Inc., and Procter & Gamble.

2003 R&D 100 Award Winners



CARISS—Computational Analysis by Raman-Integrated Spark Spectroscopy, an integrated elemental and compositional analysis of material at close, standoff, and remote distances



BASIS—Biological Aerosol Security and Information System to detect and identify airborne microorganisms



Flexible Superconducting Tape—Carries high currents in high magnetic fields at liquid-nitrogen temperatures



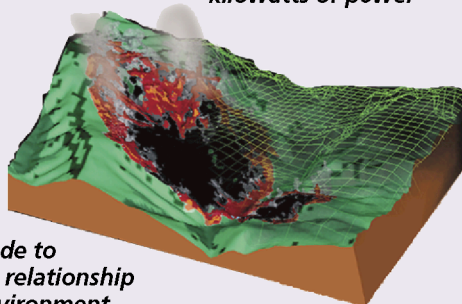
FlashCT™—High-speed, industrial, computed tomography scanning for producing high resolution, 3-D images of the exterior and interior geometries of objects



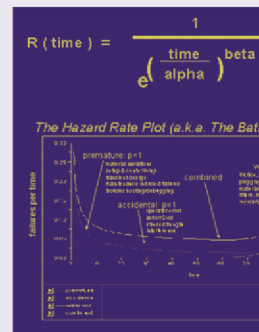
Green Destiny—The world's most efficient supercomputer, occupies less than 6 square feet and draws no more than 5.2 kilowatts of power



Super-Thermite Electric Matches—Designed to create various thermal-initiating outputs to remotely ignite fireworks, trigger explosives, or set off air bags



FIRETEC—First physics-based, 3-D computer code to simulate the interactive relationship between fire and its environment



PowerFactoRE—A suite of reliability engineering tools that can be used to enhance the performance of manufacturing systems

Industrial Partnerships

The IBD-Industrial Partnerships (IBD-IP) Program Office maintained a successful program in FY 2003 focused on developing partnerships, large and small, that enhance and support the Laboratory's mission. Once a viable partnership was identified, IBD-IP worked to value the prospective agreement, whether based on intellectual property, a Laboratory facility, or a technical staff member's time and effort, before moving forward to negotiate, execute, and maintain the appropriate agreement. While the national economy continued to struggle during the year—with the high technology sector being no exception—the staff managed to generate over \$18 million in funding received directly from industry under various research and licensing agreements.



Jerome Garcia, Program Manager

The IBD-IP Program Office comprised four teams: the Licensing Team, the Agreements Team, the Intellectual Property Team, and the Information Technology (database) Team. These teams worked together, in coordination with the other two IBD programs, to carry out the technology transfer mission of the Laboratory: To transfer Laboratory technology and intellectual property rights to companies with the objective of enhancing U.S. competitiveness in the global economy while supporting the Laboratory's mission-specific programs. IBD-IP had primary responsibility for negotiating all technology transfer agreements. These agreements include license agreements, research agreements, nondisclosure agreements, and a host of other cost-shared agreements with industry such as staff exchange and user facility agreements.

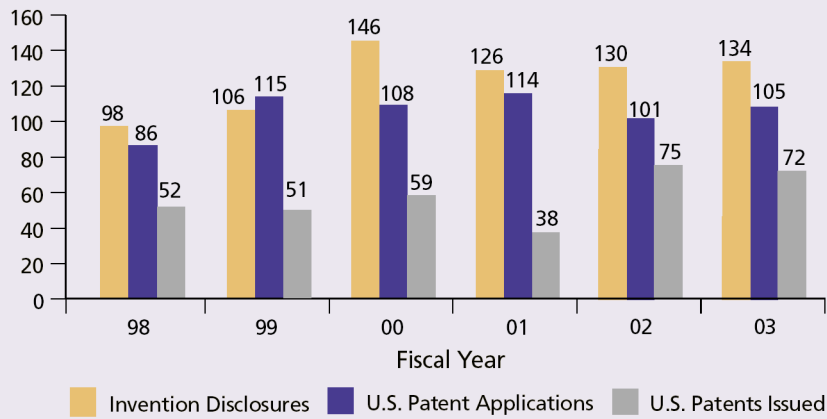
The IBD-IP teams worked closely with the LANL technical and IBD staff to develop intellectual property strategies that support the objectives of Laboratory research and development programs such as fuel cells, superconductivity, and biosensors. IBD-IP was instrumental in establishing and participating in intellectual property portfolio management teams that worked together to make strategic decisions about collaborative- and sponsored-research partners, licensees, and intellectual property positions designed to produce positive results for all stakeholders. As these decisions were made, IBD-IP negotiated, drafted, and managed sponsored-research agreements and technology license agreements that cover Laboratory-developed intellectual property (patents and copyrights). These activities help the Laboratory expand its research opportunities and enhance U.S. economic competitiveness by allowing research dollars from industry to help mature Laboratory technologies for commercialization.

Intellectual Property Management

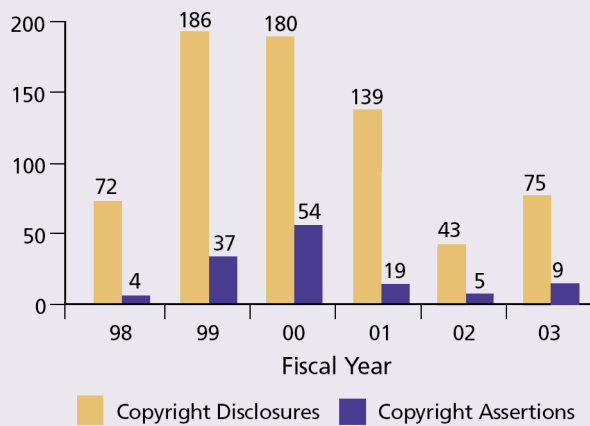
The Laboratory's ability to use the results of its own scientific research and to effectively meet its technology transfer mission depends on the protection of its intellectual property. Intellectual property includes the inventions, discoveries, software, drawings, and technical know-how of the Laboratory staff. IBD-IP worked with innovators/authors, the Laboratory Counsel-Intellectual Property Office (LC-IPO), and the other IBD program offices to identify, legally protect, and manage the Laboratory's intellectual property through patents and copyrights to enable technologies to be commercialized and to facilitate partnerships with industry. These partnerships have a positive impact on both the regional and the national economies while simultaneously expanding the Laboratory's intellectual property portfolio and generating resources for Laboratory research programs.

Intellectual Property Coordinators (IPCs)—IBD-IP continued to implement innovative programs in support of intellectual property management. In what is intended as a model of IP management, IBD-IP initiated a program to support several Laboratory divisions (Bioscience, Theoretical, and Nonproliferation and International Security) by assigning IPCs to work with their staff. The IPCs are IBD employees who reside in and work with staff in the technical divisions. The IPCs are established researchers and inventors in their own right with significant direct experience in the commercialization process. The IPCs provide "in-the-field" support to division Principal Investigators (PIs) on intellectual property matters. The IPC is the point-of-contact for PIs seeking assistance in determining whether his or her technical work may lead to an invention. Moreover, IPCs assist inventors in drafting invention disclosures,

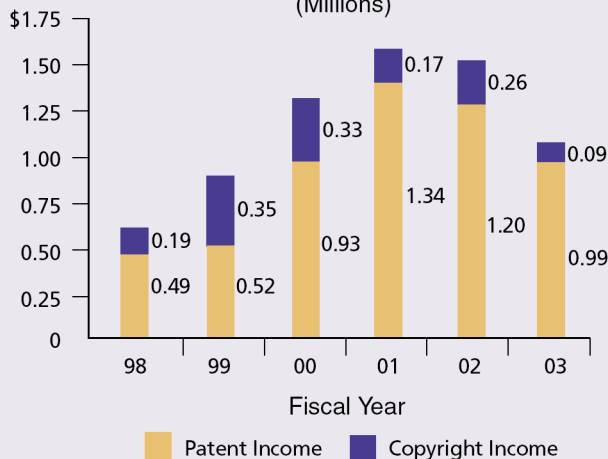
Patents per Fiscal Year



Copyrights per Fiscal Year



Annual Licensing Income (Millions)



performing quality reviews of invention disclosures, and understanding the importance of developing intellectual property strategy before initiating a technical project. The goal of the IPC is to foster awareness of intellectual property concepts and procedures that will assist a single PI or a group of PIs in achieving their long-term program and/or commercialization objectives.

Training—In FY 2002, IBD-IP participated in developing and rolling out a new Laboratory training class, “Intellectual Property Management: A Guide for Managers,” designed to provide insight to division and group managers about intellectual property, its effective management, and its importance to the Laboratory’s technical groups as a powerful tool for continued program development. During FY 2003, IBD-IP continued to promote and participate in the presentation of this class, now offered through the Laboratory’s Training and Development Office.

Patent and Copyright Disclosures—The IBD-IP Licensing Team processed and tracked incoming patent and copyright disclosures and provided value-added services, including Background Intellectual Property Reviews and Intellectual Property Analyses. The number of invention disclosures reported for FY 2003 was 134—a slight increase (3.1 percent) over the previous year’s 130 disclosures. In FY 2003, the Laboratory filed a total of 105 patent applications and had 72 patents issue. This was a 4 percent increase and 4 percent decrease respectively over the previous year. Seventy-five software copyright disclosures were submitted (a 74 percent increase over the previous year) and 11 copyright assertions (120 percent increase) were made during this time period. Thirty-six percent of the copyright assertions were for open source software, which is good news because it indicates a significant increase compared with the number of copyrights asserted over the previous three years.

Invention Disclosure Review—During FY 2003, IBD-IP and LC-IPO continued joint participation in the Patent Review Committee (PRC). The PRC, charged with making patent application filing decisions, includes IBD staff who provide commercialization assessments on invention disclosures; the LC-IPO staff who provide patentability assessments; and respected technical staff members who provide scientific and programmatic assessments. This committee has succeeded in contributing an “institutional voice” to patent decisions.

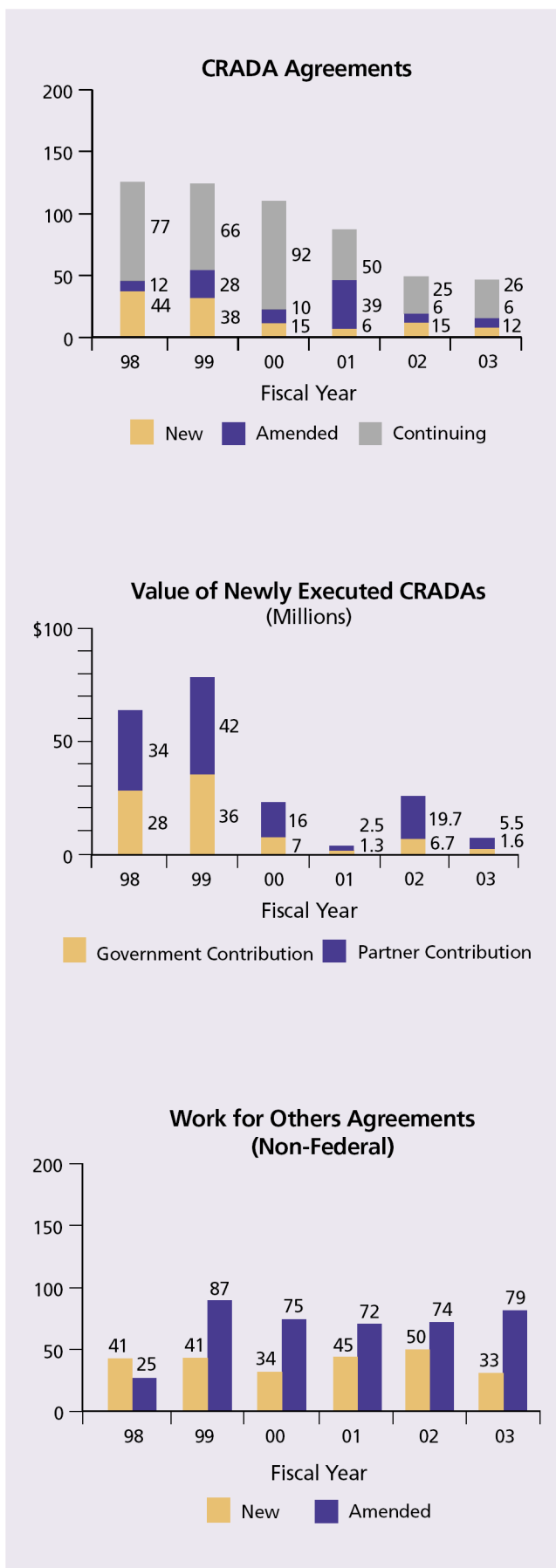
Licensing—The IBD-IP Licensing Team completed its first full year with four Licensing Executives and two Licensing Associates who worked effectively together to produce the following results:

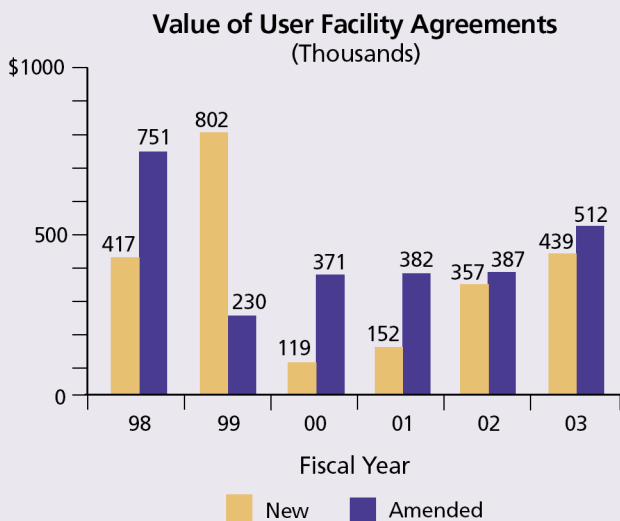
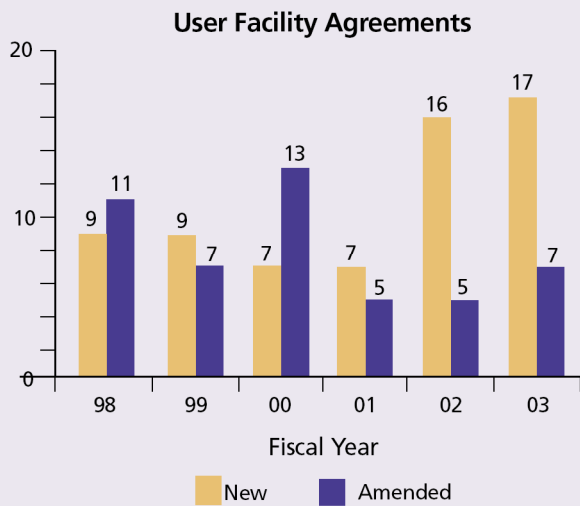
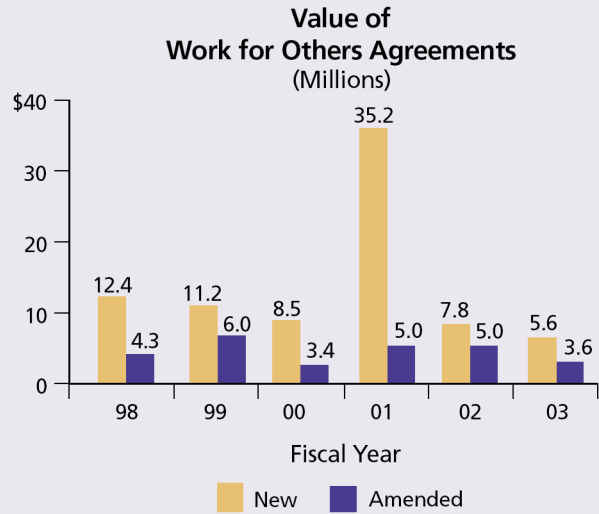
The Licensing Team generated \$1.1 million during the year resulting in a 25 percent decrease compared with the previous year’s total license income. The University of California’s Office of Technology Transfer experienced a similar drop in license income. Overall numbers of licenses executed fell as well, and the (negotiated) valuation for individual licenses in 2002 and 2003 continued to drop as a direct result of the struggling economy and lack of available funding sources for small businesses and start-ups. The Licensing Team negotiated and the Laboratory Director executed 23 commercial licenses (17 patent and 6 copyright), 561 noncommercial copyright licenses, and 8 bailment or material transfer agreements.

Laboratory Portfolio—In addition to the new licenses executed in FY 2003, the Laboratory’s license portfolio now contains more than 650 noncommercial licenses with academia, government entities, and other nonprofit organizations, and more than 180 active commercial licenses. Since its inception in 1988, the Licensing Program has generated more than \$8.5 million in license fees and royalties and granted more than 800 licenses for commercializing Laboratory technologies. License income is shared between inventors, authors, and their divisions; a small percentage is retained by the IBD Division to help support its licensing activities. Approximately two-thirds of the license income funds research, education, and technology transfer activities at the Laboratory. A portion of IBD’s share of license income is allocated to the Technology Maturation Fund, which focuses on providing up to \$50,000 in bridge funding for technologies that demonstrate a high potential for commercial value. The Technology Maturation Program plan was implemented in FY 2003.

Agreements

On behalf of the Laboratory and the University, during FY 2003, the IBD-IP Agreements Team negotiated and maintained a variety of mechanisms that enabled industry, academia, and other research institutions to establish partnerships and collaborations with the Laboratory. These mechanisms included agreements for non-disclosure of





proprietary information (NDA), cooperative research and development (CRADA), non-federal work for others (WFO), personnel exchange, and user facilities (UFA). During FY 2003, IBD-IP published a brochure, "User Facilities at Los Alamos National Laboratory," describing how a company can access these unique and useful national resources. The brochure highlights the Weapons Neutron Facility (WNR) at the Los Alamos Neutron Science Center (LANSCE) and the High Temperature Superconductivity Technology Center located in the Los Alamos Research Park. The WNR at LANSCE produces intense sources of pulsed neutrons thus providing the scientific community with the capability to perform experiments that support national security and civilian research. The High Temperature Superconductivity Technology Center enables users to fabricate high temperature superconducting tape; measure the physical and electronic properties of superconductors; and develop and demonstrate applications using superconductors. This User Facility is directed at companies engaged in building transmission cables, fault current limiters, current leads, magnetic resonance imaging, electrical generators, motors, or transformers.

The Agreements Team generated \$7.1 million in new CRADA contributions, which includes nearly \$1.6 million in federal contributions and \$5.5 million in funds-in and in-kind (non-cash contributions provided by the participant or contractor) contributions. The team executed 12 new CRADAs, amended 6 others for either additional time and/or funding, and continued to maintain another 26. The team also generated \$9.2 million through 33 newly executed WFO agreements together with 79 amended agreements. Nearly 61 percent of the total value of all newly executed WFO agreements was carry-on work from previously negotiated agreements. UFAs showed an increased value of 28 percent in FY 2003 represented by \$951 thousand in total agreement value. This increase, in part, reflects the division's commitment to assist with the growth of the UFA program. The Agreements Team also negotiated and executed 402 NDAs, representing interactions with nearly 400 companies.

Information Technology

The IBD Division uses PartnerWorks™, a Microsoft SQL-server-based application, which includes over twenty individual database modules, to manage and track all business activities, agreements, intellectual property, and day-to-day processes within the division. The IT Team developed and documented all requests for division reports from requesters such as DOE, the Department of Commerce, Laboratory management and technical divisions, and congressional offices. In FY 2003, the IT Team collaborated with the Licensing Team and the IBD Communications Team to develop a Web-linked search capability to enable users to search the database for licensable technologies according to subject areas. This capability will be launched during FY 2004.

Patent and Licensing Awards

*outStanding
innOvation*



Director Pete Nanos congratulates Distinguished Patent and Licensing Award winner Greg Swift.

Honoring Innovators

On March 2, 2004, the division sponsored the sixth annual Patent and Licensing Awards Ceremony, an event to honor and recognize Laboratory researchers who received patents or copyrights during 2003. This event also honored employees whose inventions generated license income in FY 2003. Laboratory employees received awards in three categories: Distinguished Patent, Distinguished Licensing, and Distinguished Entrepreneur. This event honored approximately 250 current and former LANL employees. One hundred twenty innovators were honored for 72 patents issued during 2003 and 128 innovators shared \$460,000 in

personal license income. Six hundred forty thousand dollars in license income remains at the Laboratory for use in technology transfer, research and development, and education.

Distinguished Patent Award

Greg Swift of Condensed Matter and Thermal Physics (MST-10) received the 2003 Distinguished Patent Award from Laboratory Director G. Peter Nanos. Swift received the award for his patent, "Oscillating Side-Branch Enhancements of Thermoacoustic Heat Exchangers." The Distinguished Patent Award is selected by the

"Our innovative prowess is a metric of our success and the quality of our science,"

. . . Laboratory Director Nanos said in his remarks at the sixth annual Patent and Licensing Awards Ceremony. "We apply this prowess to develop spinoff technologies that benefit American economic competitiveness as well as the northern New Mexico regional economy and business community."



Director Pete Nanos presents the Distinguished Entrepreneur Award to Ben Warner.

Laboratory Fellows and recognizes a premier patent exemplifying a significant technical advance, adaptability to public use and noteworthy value to the Lab's mission.

Distinguished Licensing Award

Swift was also the recipient of the 2003 Distinguished Licensing Award. This award recognizes a Laboratory employee for active engagement in the licensing process, active promotion of transferable technologies, number of licenses per technology, and support for multiple uses of the licensed technologies (private and public).

For more than 20 years, Swift's research has focused on engines and cooling technologies based on the use of sound waves. He has been awarded 32 patents. Currently, he and his team have 5 additional patents pending. Swift has been a pioneer in the Laboratory's technology transfer activities. He was the principal investigator on one of the Lab's first CRADAs. In total, he has worked on six CRADAs with companies in the area of thermoacoustic engine and cooling applications. One of these partnerships, which focused on advancing the technology for thermoacoustic cooling of natural gas, was featured in the March 20, 2003 edition of *The Economist*. Swift is an advocate for and active participant in the Laboratory's licensing process. His first technology was commercially licensed in 1992. In total, the University of California has granted rights in his technologies in four different license agreements for commercialization of his thermoacoustic engine and cooling technologies. Greg's most recent collaborative research efforts

focus on the use of his thermoacoustic technologies for a wide array of gas separation applications. These applications include the petroleum and natural gas industries for separation of crude oil and for natural gas liquefaction, air separation for oxygen, nitrogen, and argon production and for refrigeration applications. Swift's exemplary work sets a standard of excellence in support of the Laboratory's technology transfer mission.

Distinguished Entrepreneur Award

Ben Warner of Actinide, Catalysis, and Separations Chemistry (C-SIC) was also honored at the ceremony as the Laboratory's 2003 Distinguished Entrepreneur. Warner, winner of the 2002 Distinguished Licensing Award, has inventions that include electrochromic window tinting and micro X-ray fluorescence for drug discovery. He worked to commercialize a radiation dosimeter and helped in the successful licensing of the electrochromic window technology to a small business. Warner developed a business plan for the X-ray fluorescence technology and formed a company to compete for the license.

The Distinguished Entrepreneur Award honors an individual whose hard work, ingenuity, innovation, and perseverance have contributed significantly to the Lab's ongoing efforts in commercialization and entrepreneurship. Some qualities the panel looks for are based on someone who has demonstrated substantial financial and personal risk taking, innovative and creative thinking, and professional business planning.

Technology Commercialization Office

For seven years, the Technology Commercialization Office (TCO) has led IBD's efforts to leverage Laboratory technologies in order to stimulate technology business startups, create job opportunities, and attract entrepreneurs, businesses, and capital to northern New Mexico. For the past two years, TCO has also led efforts to identify, assess, mature and market technologies to both small and large industrial partners in the region and nationally. In FY 2003, TCO paid particular attention to the task of identifying and maturing LANL inventions and building relationships with and marketing to potential partners and investors. Overall, in FY 2003, TCO experienced a change in focus and utilization of resources, outsourcing many of our previous activities in order to focus on "priming the pump." The Laboratory's biggest contributions to regional economic development are our technological innovations and our intellectual capital when transferred effectively to the private sector. The identification, evaluation, and maturation of these innovations and support for our entrepreneurially minded staff are, therefore, the first and quite possibly the most important steps toward successful fulfillment of our regional economic development charter.



Belinda Padilla, Program Manager

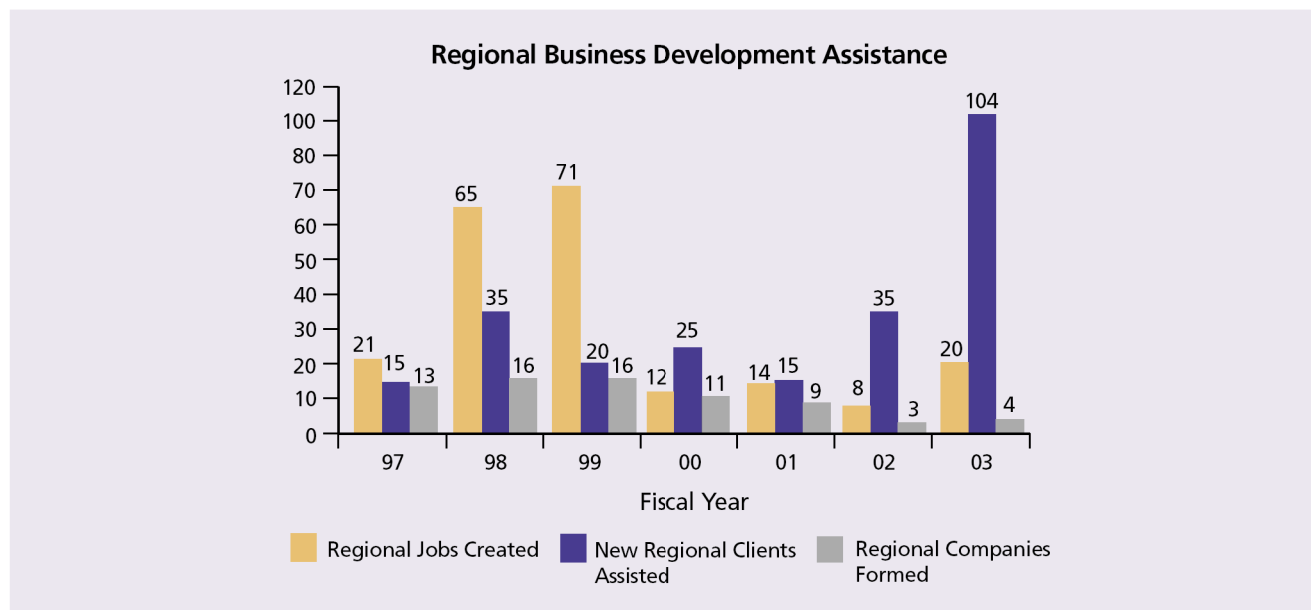
2003 Program Highlights

Regional Business Development—Throughout FY 2003, TCO continued to offer a broad range of services to regional businesses and fledgling entrepreneurs. These services included market assessments, expert business counseling, and access to funding sources, networking events, and professional organizations. Over the last seven years, TCO has assisted 254 new clients—77 of which are new startup companies. These new startups have created 270 jobs and attracted \$67 million dollars in capital investment into the region. Despite tough economic conditions, over 70 percent of these startups remain in business. Since 1997, 25 Laboratory employees have taken Entrepreneurial Leave of Absence from their technical positions to start or participate in new regional companies based on Laboratory technology or expertise. Although six have returned to the Laboratory, 19 are still working in the private sector.

In FY 2003, TCO assisted five new start-ups:

- **National Laboratory Software**—a startup company established to market Laboratory-developed software and copyrights
 - **San Cristobal Development**—a startup launched in January 2003 to develop the beta site for Solar Reduction of Carbon Dioxide (SOLAREC)
- In addition, three new licenses were awarded to New Mexico startup companies including Radion Technologies, and FY 2002 startups Advanced Realtime Technologies (field portable real-time air particulate monitor) and Biophoretix (magnetic microspheres' technology). A license was also awarded to Enki, an Arizona startup company, to commercialize LANL's electrochromic-mirror technology.
- **Radion Technologies**— a provider of revolutionary solutions for radiative transport simulations
 - **Consonant Technologies**—a provider of instrumentation for chemical analysis, scientific and technical research and development, and consulting services
 - **Protolife**—a newly formed business based on design, development, and application of artificial cells

Technology Maturation Fund—Taking new ideas through the "valley of death"—the very early stage in the life of an idea when the level of technical risk is at its highest—is the stage when securing funding is most difficult. New ventures often fail to obtain funding because significant gaps exist between what a venture is offering investors and what potential investors are seeking. It is extremely difficult for researchers to conduct the high-risk, early stage research demanded by program sponsors while also engaging in efforts to commercialize their technology. In December 2002, IBD established the Technology Maturation Fund to address this challenge—to help mature nascent technologies that reflect strong commercial potential.



The objective of the Technology Maturation Fund is to provide small amounts of funding to move early stage technologies closer to commercialization. These awards are not for a specific time period but rather to achieve a specific development milestone on the path towards commercialization—potentially removing development hurdles for early stage Laboratory technologies. The annual \$450,000 fund comes from a portion of the \$1 million allocated to TCO in support of regional economic development activities and a portion of the Laboratory’s annual \$1.0–\$1.5 million in technology licensing revenues. Grants can range from \$10,000 to \$50,000, enabling the further development of 10 to 15 technologies per year.

In FY 2003, the program received 26 proposals and made 11 awards totaling \$389,000. The average award size was \$35,400. The program funded a very broad range of technologies from pollution prevention/remediation and image analysis software to biomedical instrumentation and automotive components. These technologies draw on superconductivity, acoustic technology, plasma physics, chemistry, materials science, and computer science. Proposals were submitted from 11 technical divisions [Bioscience (B), Chemistry (C), Computer and Computational Sciences (CCS), Decision Applications (D), Engineering Sciences and Applications (ESA), Health, Safety and Radiation Protection (HSR), Materials Science and Technology (MST), Nuclear Materials Technology (MST), Nuclear Nonproliferation (N), Physics (P), and Risk Reduction and Environmental Stewardship (RRES)]. Six divisions received funding including C, ESA, MST, N, P, and RRES. Specific outcomes included

- five new inventions;
- three new CRADAs (negotiated or executed);
- five new licenses (negotiated or executed, including startups); and

- validation of three new startup concepts.

Active Networking and Marketing Activities—Networking and active marketing have been one of the most important program elements within TCO. Networking activities provide the Laboratory and IBD with a visible and collaborative presence in the community. In addition, these networks are the single most effective tool for identifying commercialization partners, potential investors, and entrepreneurial talent. Networking events sponsored or co-sponsored by TCO included the bimonthly Coronado Ventures Forum, monthly meetings by the several New Mexico professional technology trade associations (software, Internet, and biosciences), and the New Mexico Entrepreneurs Association. TCO has continued to actively participate in national networking organizations such as the University of California at San Diego’s UCSD CONNECT and the National Association of Seed and Venture Funds.

Attracting Venture Capital to the Region—In FY 2003, the National Nuclear Security Administration (NNSA) appropriated \$3 million dollars to Technology Ventures Corp. (TVC), a Lockheed Martin-funded nonprofit, to support Sandia National Laboratories, LANL, and sites in California and Nevada with their technology commercialization activities. TVC is a well-known entity around New Mexico striving to inspire new technology company growth by aiding in commercialization of Lab technologies and putting small businesses in touch with venture capitalists. TVC opened an office in the Los Alamos Research Park in 2003 with a small staff of project managers who are working with IBD to identify technologies with commercial potential, assist entrepreneurs with forming businesses, and capture investor interest in such companies.

In FY 2003, TCO continued to assist venture capitalists (VCs) interested in establishing an office in New Mexico

and maintained active relationships with the established, local, seed investment community. Specifically, TCO hosted visits by 12 New Mexico-based VC firms, 12 out-of-state VCs, and 10 angel investors (including representatives of four angel clubs)—introducing them to a variety of LANL investment opportunities. TCO also assisted the state in recruiting five new VCs to open offices in New Mexico this year, working particularly hard to recruit vSpring. vSpring is an early stage venture capital fund that capitalizes on the managerial skills and operating experience of its principals to successfully invest in and mentor early stage technology companies. It is the first venture capital firm to establish an office in Los Alamos, which it did in August 2003. To date, it is the state's largest investment in a qualified venture firm.

Resource Optimization—Our Technology Commercialization Executives continued to identify and assess early stage technologies with commercial potential during FY 2003, providing assistance to LANL's Patent Review Committee in the review and assessment of invention disclosures, supplying market information to the IBD-IP Licensing Team and collaborating with the rest of IBD on optimal commercialization strategy development. In summary, TCO reviewed approximately 140 new invention disclosures in the effort to provide guidance to the PRC. (The review process included personal interviews with inventors, initial market assessments, development of Web postings for 90 inventions, and identification of and contact with potential licensees.) In the area of regional business development, TCO assessed market opportunity, technical feasibility, and business strategy for 13 Lab spinouts and six other regional startups. Ten of these startups also received help preparing fundraising pitches and introductions to angel and venture investors.

In FY 2003, TCO worked closely with TVC staff to identify candidates for the annual New Mexico Equity Capital Symposium. Four Los Alamos companies were presenters at the May 2003 event, including LANL licensees Biophoretix and Interferometrics and Los Alamos-based companies Veriscape and Jemez Technologies. TVC also led efforts to launch the New Mexico Technology Research Corridor (NMTRC) Collaborative along with 11 of the state's various publicly funded research institutions. A 2003 study completed by TVC and Sandia National Laboratories found that all or most of New Mexico's federal labs, military entities, and universities shared common research themes that could be gathered into "families" of patents to be transferred to and commercialized by the private sector.

MBA Internships—From the initiation of this summer internship program in 1997 through FY 2003, 48 MBAs from 19 top-tier business schools have completed internships with IBD. During summer 2003, interns worked on projects ranging from a market assessment on magnetic microspheres and the valuation of electrochromic mirrors to the valuation of the commercial potential of a Linux

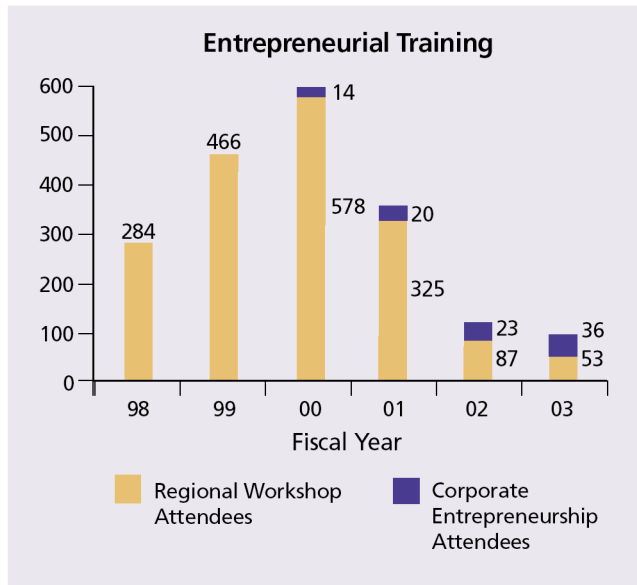


Summer intern Kurt Faulhaber (right) visits a northern New Mexico mine with Laboratory scientist David Reagor to test Reagor's underground radio technology for commercialization potential.

cluster supercomputer. Overall, students completed 20 projects—13 based on LANL technology, two with regional start-ups, and three related to other regional projects. In addition to the traditional technology scouting and entrepreneurial-based projects, in 2003 three students undertook larger projects with a much broader scope: a patent pooling project with UNM (to be integrated with the efforts of the NMTRC), a statewide digital media technology inventory for the New Mexico Film Office (also to be integrated with NMTRC), and an opportunity assessment in the area of hydrogen clusters for the State of New Mexico. This opportunity assessment [www.lanl.gov/partnerships/pubs.htm] is a critical document that will be used by the state to assess the plausibility of establishing a hydrogen cluster in the state, illuminate New Mexico's competitive assets and shortcomings, and to justify allocation of state funds to begin nurturing a hydrogen cluster initiative (HyTeP) in New Mexico.

Training Programs—In order to increase understanding of and participation in the technology commercialization process, TCO's commercialization and entrepreneurship training series targets LANL technical staff members interested in participating in the commercial assessment of their technologies. The workshops, Opportunity Assessment and Market Feasibility, provide a context for commercialization activities at LANL, articulate how to assess the commercial value of an invention, and help participants evaluate the best channel for commercialization—i.e., licensing, strategic alliance, or startup. Fifty-six Laboratory employees participated in this training in FY 2003. Through this course offering, 36 new technologies were evaluated. Many of these were identified as potential startup or licensing opportunities.

In FY 2003, TCO worked with Venturequest Ltd. to develop a training module that would be the next phase



in the technology feasibility process—validation of the market opportunity identified in the Opportunity Assessment class. The course includes guidance in the process of conducting primary market research—actual interviews with potential customers and/or clients. The market validation program was launched in June 2003. The course developed by TCO staff has been used as a model for classes now taught by Venturequest at Fortune 500 companies (Boeing, First Data, etc.) and in Europe (Vatervall in Sweden). In FY 2003, five LANL staff members participated in this new training course.

In FY 2003, IBD-TCO joined IBD-IP in promoting to our internal customers the Intellectual Property Management training course for managers offered through the Laboratory's Training and Development Office. One class was offered to managers in FY 2003. An institution-wide lack of understanding of the value of intellectual property and the process for disclosing and protecting inventions motivated IBD to pilot the intellectual property education course for LANL staff and management in FY 2002. We plan to market this training much more aggressively in 2004, targeting group-level managers, new employees, and technical staff members.

Over the last seven years, IBD-TCO has sponsored 34 internal and external training workshops to educate entrepreneurs and technologists about the basics of launching a business. More than 2300 Laboratory staff and regional entrepreneurs have participated in 24 external workshops and 10 internal training seminars since 1997. Through our agreement with TVC, IBD-TCO actively promoted courses offered by the TVC-sponsored Center for Commercialization and Entrepreneurial Training. These courses were piloted in June of 2003 by TVC with three courses offered in FY 2003. The courses were held in Los Alamos and Santa Fe. These training courses covered the following topics:

entering the entrepreneurial world, market research and the marketing plan, and financial management. IBD-TCO also co-sponsored four Small Business Innovative Research (SBIR) Proposal Writing Workshops and counseling for SBIR candidates in FY 2003.

Leveraging the Relationship with UCSD CONNECT—

The IBD-TCO presence at UCSD CONNECT (staffed by a TCO Business Development Executive) enhances LANL's ability to market its life science and information technologies to a broader audience and affords TCO the opportunity to evaluate CONNECT business programs that can be replicated in northern New Mexico. In FY 2003, TCO began to participate in and leverage a key program at UCSD CONNECT, the Center for the Commercialization of Advanced Technology (CCAT). CCAT was chartered in 1999 to seek out and fast track the commercialization of new innovative technologies relevant to the fields of crisis and consequence management, homeland security, and high priority Department of Defense needs. The CCAT program offers a full range of commercialization services including product development cash awards, market studies, business plans, and mentoring activities provided by successful business people, entrepreneurs, and venture capitalists.

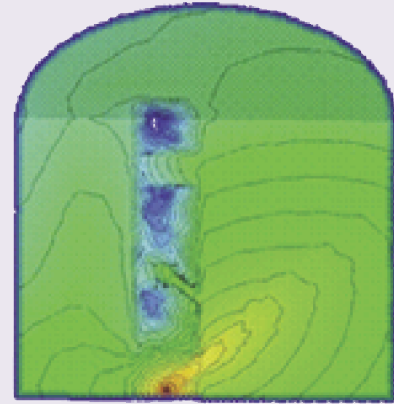
The first CCAT solicitation in FY 2003 was opened in September 2002. The announcement resulted in 102 applications—93 from industry, 5 from universities, and 4 from government laboratories. TCO supported one application from Advanced Realtime Technologies (ART). ART was awarded a \$75,000 Prototype Development, Test and Evaluation Grant (PDTE) and access to an MBA team from San Diego State University for additional market assessment help. The April 2003 solicitation attracted 111 applications—100 from industry, 7 from government laboratories or companies with licensed government intellectual property, and 4 from academic research institutions. A spinout from LANL, STAR Cryoelectronics, which develops and markets sensor control electronics, was awarded a PDTE grant.

Support for LANL's Carlsbad Office—IBD-TCO has one staff member deployed in Carlsbad, NM, who is responsible for regional economic development efforts near the WIPP site as part of a proactive approach to mitigate potential job losses and other potential economic vulnerabilities that could be realized if shipments to WIPP are accelerated over the next few years bringing WIPP to full storage capacity well ahead of schedule. One element of these efforts is initiatives to provide more advanced-education alternatives in southern New Mexico. In FY 2003, an MBA intern was hired to work in Carlsbad where she carried out a three-month study to evaluate the need and the mechanisms for a distance-learning program in the Carlsbad area.

Turning Technologies into Businesses

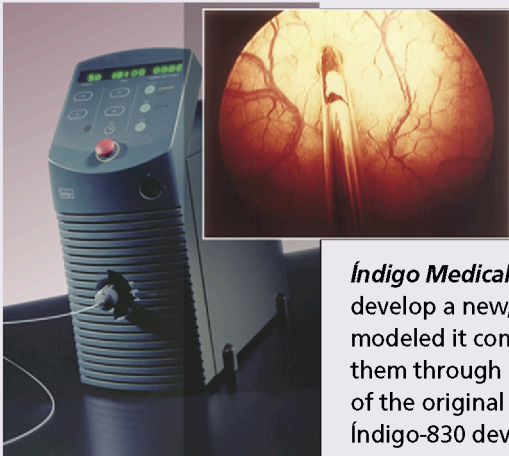
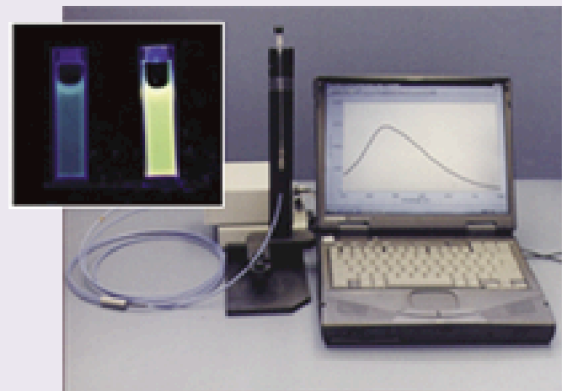


HYTEC—established in 1993 by two former LANL design engineers—uses LANL-licensed imaging and measurement technology to perform high-speed, industrial, 3-D X-ray scanning. The company’s well-equipped prototyping and testing laboratories in Los Alamos, NM provide full-service engineering and development to customers. HYTEC currently employs about 40 people.



Radion Technologies—a Los Alamos startup established in October 2002, met and exceeded initial milestones during its first year in business. Located in the Los Alamos Research Park, Radion provides revolutionary solutions for radiative transport simulations. The product, based on the Attila radiation transport software licensed from LANL, performs calculations required for modeling neutron, photon, or charged-particle behavior used in many applications including nuclear power development, medical imaging, cancer therapy, radiation safety, satellite shielding, spent fuel storage and disposal, and nuclear oil-well logging.

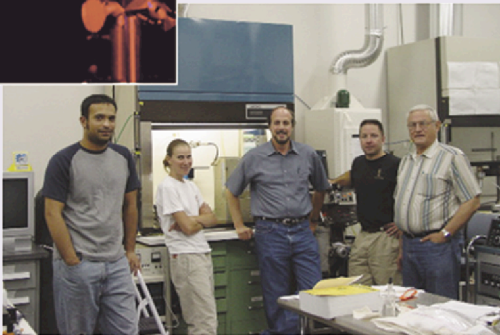
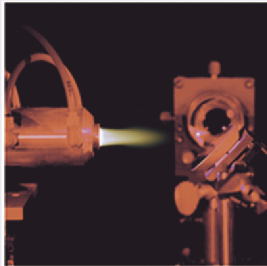
QTL Biosystems—founded in 1999 by two LANL researchers on Entrepreneurial Leave—employs a new technology invented by the founders and licensed from LANL. The QTL (quencher-tether-ligand) technology enables a remarkably versatile new line of biosensing and biomedical assay products. QTL has secured multimillion-dollar funding from the Defense Advanced Research Agency (DARPA) and private investors and employs 22 people in Santa Fe, NM.



Indigo Medical Inc.—collaborated with LANL scientists in the late 1980s to develop a new, nonsurgical way to treat benign prostate enlargement. “We modeled it computationally, built the first prototype instruments, and carried them through animal trials,” said the former LANL scientist who received one of the original patents. Following Food and Drug Administration approval, the Indigo-830 device has been on the market for several years. Johnson & Johnson acquired the company in 1996 for \$140 million.



Amtech®—founded in 1984 by five LANL researchers—makes dedicated short-range communications systems based on radio frequency identification technology. Products enable communication between readers and electronic tag devices attached to vehicles, equipment and containers. The TransCore Amtech Technology Center in Albuquerque, NM, leads current R&D efforts for products used by companies worldwide to identify, track, and monitor railway, toll points, and parking, and for other access-control applications.



Apjet Inc.—established in 2002 by LANL staff members and a LANL consultant—licenses revolutionary materials’ processing technologies from LANL. Using a gas stream of reactive chemicals to clean, decontaminate, etch or coat surfaces at atmospheric pressure and low temperature, the Santa Fe, NM, startup is providing a service that is quicker, cheaper, and more environmentally friendly than similar processes that require a vacuum environment.



DoXcelerate (formerly IWA, Inc.)—founded in 1996 by three LANL employees on Entrepreneurial Leave—provides a workflow system that allows geographically dispersed users to collaborate on producing corporate policies, reports, and procedures. The company’s original search and retrieval technology, first deployed in 1994, was part of the Department of Energy’s Technology Information Network, a collaborative effort between LANL and 10 other DOE laboratories. DoXcelerate, a leading solution provider for multi-author documentation, employs nine people in Los Alamos, NM.



Strategic Outlook

The Laboratory's partnerships with industry and other outside organizations is critical to our success in performing the mission, in recruiting and retaining staff, and in obtaining the maximum benefit from our technologies. The Laboratory remains strongly committed to regional economic development and to assisting community development initiatives through startup and spinoff companies.

The innovations developed at Los Alamos National Laboratory, from fuel cells to novel radiation detectors and computer codes for modeling biological processes, impact the economy and the future of research and development in multiple ways. The transfer of technologies from the Laboratory to other organizations remains an important mission for the Laboratory and part of our contractual commitment. Universities, government agencies, other government contractors, and private companies all use LANL-developed technologies. As the mission needs continue to evolve and the Laboratory evolves and develops new technologies, we will continue to move our technologies to other users.

According to Bruce Mehlman, U.S. Department of Commerce Assistant Secretary for Technology Policy, "Labs serve as unique and effective partners by bringing unique and hard-to-duplicate facilities, longstanding relationships with the most innovative companies, highly educated experts, and a congressional mandate to promote tech transfer... If innovation and entrepreneurship profoundly *shaped* the 20th century, they will *define* the 21st. Knowledge development and technology commercialization are the new drivers of economic growth, both in the U.S. and around the world. Our ability to create new innovations and harness their power will directly impact our national prosperity, security, and global influence." (From "Partners on a Mission: Federal Laboratory Practices Contributing to Economic Development," U.S. DOC, OTP, Nov. 2003.)

We expect the coming year to be one of significant change for both the Laboratory and IBD. Numerous business processes are changing and will continue to change over the next two to three years. The IBD External Advisory Board provided a number of observations and suggestions for IBD as we work on continuous performance improvement and take on new challenges. We will look at IBD organization, staffing, skill mixes, processes, thrusts, and priorities. This strategic planning initiative for IBD will position us for the future, with its uncertainties in the economy, the Prime Contract, and the evolving Laboratory mission. As we work through these changes, we look forward to our vital role in strengthening the Laboratory's contribution to regional and national economic prosperity.



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Agreement Types, Definitions, and Conditions

Agreement	Rights in Intellectual Property	Laboratory Resource Commitment	Industry Resource Commitment
<p>Cooperative Research and Development Agreement (CRADA): Enables industry, academia, and non-profit entities to collaborate with the Laboratory for the purpose of joint R&D activities.</p>	<p>Each party may take title to its own CRADA-generated intellectual property. Partners have first rights to an exclusive license in a designated field of use. The U.S. Government retains a nonexclusive, royalty-free, irrevocable license to every subject invention under a CRADA.</p>	<p>Cost-shared through contributions of personnel, equipment, services, and facilities.</p>	<p>Cost-shared through contributions of personnel, equipment, services, materials, facilities, and funds.</p>
<p>Non-Federal Work for Others (WFO) Agreement: Enables a non-federal partner to ask the Laboratory to perform a defined scope of work or list of tasks that draws upon the unique capabilities of the Laboratory. It may not place the Laboratory in competition with the private sector. (Also known as a funds-in agreement or a sponsored research and development agreement.)</p>	<p>Rights to Laboratory inventions generated under a WFO Agreement may be available to a sponsor under DOE's Class Waiver.</p>	<p>Personnel, equipment, materials, and facilities are used.</p>	<p>Sponsor covers the cost of all Laboratory work (including personnel and materials) to be completed under the Statement of Work signed by both parties.</p>
<p>Personnel Exchange Agreements: Industrial Fellow Agreements allow Laboratory staff members to work at a partner company.</p> <p>Industrial Assignment Agreements allow Laboratory staff members to work in the private sector.</p> <p>Industrial Staff Member Agreements allow private-sector staff to work at the Laboratory.</p>	<p>All are subject to negotiation.</p>	<p>The Laboratory and partner cost-share the Industrial Fellow.</p> <p>Loan of Laboratory personnel (subject matter expert).</p> <p>Office space, laboratory, and support costs for Industrial Staff Members assigned to the Laboratory.</p>	<p>Partner pays percentage of salary; provides office space, laboratory, and associated support costs.</p> <p>Company pays costs (salary and benefits) for Laboratory staff on assignment to company.</p> <p>Company pays costs for Industrial Staff Member assigned to the Laboratory.</p>
<p>User Facility Agreement: Permits outside users from industry, universities, and other governmental agencies, to conduct research using the Laboratory's unique experimental research equipment and facilities.</p>	<p>User retains rights.</p>	<p>None</p>	<p>Partner covers all costs associated with using the facility for the tasks defined in the scope of work.</p>
<p>Non-Disclosure Agreement (NDA): Protects proprietary information exchanged between parties during initial interactions and discussions between the Laboratory and another party on specific technical areas.</p>	<p>None—no IP is generated by either party under an NDA.</p>	<p>None</p>	<p>None</p>
<p>Memorandum of Intent (MOI) Non-binding document signed by parties interested in pursuing a comprehensive agreement for the transfer of technology which defines specific technical areas of interest and the ground rules for interactions and discussions between the parties.</p>	<p>None—no IP is generated under an MOI.</p>	<p>None</p>	<p>None</p>

