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The Only Government-wide Forum for Technology Transfer

T² Events

FLC Southeast
Regional Meeting
Charleston, S.C.
Sept. 17-19, 2003

Technologies for Public
Safety & Critical
Incident Response Expo
St. Louis, Mo.
Sept. 23-25, 2003

FLC Northeast/Midwest
Joint Reg. Meeting
New York, N.Y.
Oct. 1-3, 2003

International Biotech &
Infotech Summit East
Washington, D.C.
Oct. 20-21, 2003

2003
NASVF Conference
Baltimore, Md.
Nov. 2-5, 2003

CMMI
Technology Conference
Denver, Colo.
Nov. 17-20, 2003

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for a complete
calendar of events

T² Fact

Born in 1771 in
Illogan, Cornwall,
England, Richard
Trevithick developed
the first steam-powered
locomotive in 1804.
Built for the road, not
for the rail, his machine
was too heavy and
broke the very rails it
was traveling.
- inventors.about.com

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EPA Partners with UPS, DaimlerChrysler

Environmental Protection Agency (EPA) Administrator Christine Todd Whitman joined senior executives from DaimlerChrysler and UPS

to announce a new government-industry partnership to put hydrogen-powered fuel cell delivery vehicles on the road.

For the first time, fuel cell delivery vehicles will be tested in a real-world driving environment on the nation's streets. Whitman unveiled this initiative at the EPA's **National Vehicle and Fuel Emissions Laboratory** (NVFEL) in Ann Arbor, Mich., May 19, 2003.

"Working together, we are making an important new delivery," said Whitman. "This commitment to bring the first fuel cell vehicle into a commercial delivery

fleet is a joint effort that will be delivering something to all Americans – something that will help make the air we breathe cleaner and our skies clearer."

This will be the first time zero-emission medium-duty fuel cell delivery vehicles are introduced as part of a commercial vehicle fleet in the United States. The fuel cell test program will be based in Ann Arbor, Mich., at NVFEL.

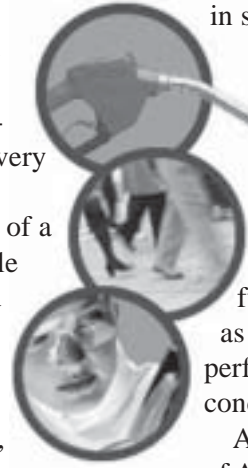
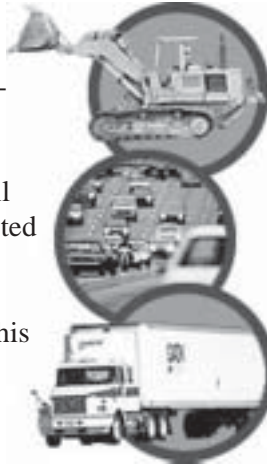
Later this year, a passenger-sized fuel cell test vehicle based on the DaimlerChrysler Mercedes-Benz A-Class will be available for use as an express-delivery vehicle by UPS. In

2004, one or more fuel cell-powered Dodge Sprinter vans will be delivered as the first medium-duty fuel cell commercial vehicle to be put in service in the United States.

The DaimlerChrysler fuel cell vehicles will be used in typical UPS delivery operations on established routes. The program will enable the EPA and the partner companies to continue evaluating fuel cell vehicle attributes—such as fuel economy and driving performance—under varying weather conditions.

Air Products and Chemicals, Inc., of Allentown, Pa., will design and build the hydrogen fueling station. This will allow the EPA, DaimlerChrysler and UPS to evaluate the operations of fuel cell fleet

See EPA, UPS, Daimler, page 4



International Transfer of Energy Techs

Secretary Abraham Wants "International Partnership for the Hydrogen Economy"

Secretary of Energy Spencer Abraham called for the development of international collaboration in advanced research and development that will support the deployment of hydrogen energy technologies. Abraham announced the initiative during a presentation to the International Energy Agency ministerial meeting on April 28, 2003.

"International cooperation is key to achieving hydrogen and fuel cell program goals such as those President Bush stated in his recent State of the Union address," Secretary Abraham said. "Partnerships that leverage scarce resources, develop technology standards, and foster private-public technology and infrastructure collaboration can more easily overcome the technological and

institutional barriers that inhibit the development of a cost-competitive, standardized, widely accessible and safe hydrogen economy."

An International Partnership for the Hydrogen Economy will establish cooperative and collaborative efforts in hydrogen production, storage, transport, and end-use technologies; common codes and standards for hydrogen fuel utilization; and the sharing of information necessary to develop hydrogen fueling infrastructure.



"International cooperation is key to achieving hydrogen and fuel cell program goals." -Secretary Abraham

"The vision of the International Partnership for the Hydrogen Economy

is that a participating country's consumers will have the practical option of purchasing a competitively priced hydrogen power vehicle, and be able to refuel it near their homes and places of work, by 2020," Secretary Abraham added.

A growing number of countries have committed to accelerate the development of hydrogen energy technologies to improve their energy, economic, and environmental

See International Transfer page 4

Licensing Income Declines at Major DOE Labs

by Neil MacDonald
Federal Technology Watch

Patent and copyright portfolios at three major Department of Energy national labs—Los Alamos (LANL), Lawrence Berkeley (LBNL), and Lawrence Livermore (LLNL)—produced licensing income of \$5.29 million in FY2002, a 4% decline from the previous year, according to figures obtained by *Federal Technology Watch*.

Patent income at the three labs dropped 10%, while copyright income rose 48% in the period that ended September 30, 2002.

FY02 royalties and fee income at Los Alamos was \$1,428,000. Of this, patents and "tangible research products" (TRPs)

See Licensing Decline, page 5

Lab in the Limelight A Study in Aquaculture

The mission of the **Harry K. Dupree Stuttgart National Aquaculture Research Center** (SNARC) is to conduct aquaculture research to address the highest priority needs of the U.S. aquaculture industry.

The center's research programs focus primarily on three areas:

- Production Systems Research, including development of feeds and improved culture strategies for warmwater fish species, other than catfish, such as hybrid striped bass, baitfish, ornamental fish and carp
- Disease Therapeutics Evaluation and Registration Research for catfish, trout, tilapia, baitfish, and hybrid striped bass



SNARC facilities include an 18,000 ft² bench research laboratory and a 3,700 ft² wet laboratory equipped for multi-use aquaria and tank studies.

See Lab in Limelight, page 4

Fed Labs Flash

Technology Transfer Notes from Within the Federal Laboratory Community

Propulsion Engineer Honored



Kathleen Sargent

The Air Force recently awarded **Kathleen Sargent**, a Propulsion Directorate engineer, the 2002 Air Force Science and Engineering Award for Manufacturing Technology. Ms. Sargent was recognized for her exceptional work in the development of turbine engine composite components and materials. She was instrumental in the successful demonstration of a new design concept, a metal matrix composite (MMC) remote ring compressor rotor.

Ms. Sargent was responsible for bringing the design concept of the remote ring rotor to fruition by creating and leading a government and industry panel to address the shortcomings of this technology area. As a result of her efforts, a new method for fabricating the rings was devised, and the feasibility of the remote ring compressor rotor concept was successfully demonstrated.

Under this agreement, QuickSilver will produce and market the ECBC invention. The BiSKit was developed in response to the increased need for biological sampling that arose after the anthrax attacks of October 2001. The BiSKit modernized the traditional methods of biological sampling, making it easier, safer and more reliable.



“This agreement is an excellent example of how ECBC transitions military technologies to the civilian sector,” said **Jim Zarzycki**, ECBC technical director.

“Technology transfer is an important component of our work at Edgewood.” QuickSilver is a defense-related analytical laboratory that has vast experience with chemical warfare and warfare-related chemicals. QuickSilver offers on- and offsite fully equipped laboratories, sample analysis, and project management services. The company can be reached at 410-676-4300.

Conference is an excellent opportunity for your lab and agency to exhibit and demonstrate products to senior DOD R&D heads and program managers.

There will be many opportunities for partnering and teaming DOD agencies with academia and industry for R&D in protection security technologies.

It's also an excellent opportunity to get an overview of the latest and greatest in protection security technologies, as well as learn about the latest needs and threats in security.

More info: www.moscitechconference.com

Bush Extends PCAST, PITAC

by *Neil MacDonald*
Federal Technology Watch

In a little noticed bureaucratic act May 28, President George W. Bush signed Executive Order 13305, extending by two years the life of the President's Information Technology Advisory Committee (PITAC) and the President's Council of Advisors on Science and Technology (PCAST). The president's action allows PITAC to continue to offer advice. Without the extension, the Executive Order would have expired this past weekend. PITAC's and PCAST's terms have now been extended to June 1, 2005.

ECBC Licenses Innovative Sampler to QuickSilver

Edgewood Chemical Biological Center (ECBC) recently announced a patent licensing agreement with QuickSilver Analytics, Inc., of Abingdon, Md., to produce its Biological Sampling Kit, or BiSKit, for commercial sale.

Science & Technology Conference

Hosted by the **U.S. Army Maneuver Support Center** at Fort Leonard Wood, Mo., August 19-21, the *Protection and Security at Home and Deployed Science and Technology*



Lab Work Berkeley Lab Seals the Deal

Scientists at the **Department of Energy's Lawrence Berkeley National Laboratory** (LBNL) have invented an aerosol-based system called MASIS to seal the ducts of large commercial buildings.

A new atomizer prevents nozzle clogging by using high-velocity heated gas, which mixes and dries the liquid sealant to cool an insulating layer of ambient-temperature air.

MASIS, which stands for “mobile aerosol-sealant injection system,” is based on the aerosol duct-sealing device developed by LBNL researchers to seal ducts and reduce energy loss in residential and small commercial systems. It incorporates two new patented technologies that permit effective sealing in the larger, more complicated duct systems of commercial buildings.

Duo Wang, a scientist in LBNL's Environmental Energy Technologies Division, developed the technology, with assistance from **Mark Modera**, the scientist who developed the original sealing system for residences. Carrier Aerospace has exclusively licensed the system for sealing ducts in commercial buildings.

Modera and colleagues developed the aerosol-based technology for sealing the ducts of heating, ventilating, and air-conditioning (HVAC) systems in residential and small commercial buildings in the 1990s. Their research showed that U.S. homes that had ducts in contact with outside air wasted, on average, 20 percent of all heating and cooling energy due to leaky ducts.

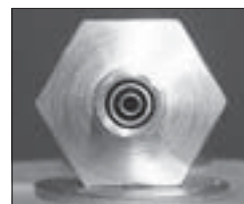
They pioneered a system that could seal these ducts remotely and inexpensively, using an aerosol that is injected into the ducts through the home's heating register. The aerosol flows through the system, gradually building up a flexible seal at holes, tears, and other duct leaks.



The new atomizer prevents nozzle clogging by using high-velocity heated gas (through outer orifice), which will mix and dry the liquid sealant (center orifice) to cool an insulating layer of ambient-temperature air (middle orifice).

Although LBNL research continues to quantify the losses in commercial buildings, scientists here estimate that sealing ducts in these buildings could potentially save billions of BTUs of natural gas and billions of kilowatt-hours of electricity. (A Btu, or British thermal unit, is the heat required to raise the temperature of a pound of water by one degree Fahrenheit.)

More info: Allan Chen, (510) 486-4210, or <a_chen@lbl.gov>



The prototype induced-cooling pneumatic atomizer is made with standard tube fittings.

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Tech Watch

Federal Laboratory Technologies Ready for Transfer

Weights & Measures Quick Calibration

Westinghouse Savannah River Company's Balance Checker software evaluates the performance characteristics of balances and scales against manufacturers' and/or user-defined specifications. With minimal input from users, the software uses an array of statistical tests to calculate the total measurement uncertainty of balances and scales.

The user selects a balance model from a pull-down menu. Balance Checker is



preloaded with the recommended tolerances for optimal performance of balances from most

major manufacturers. The user places weights on the balance and enters the displayed measurements into the program, which automatically calculates linearity, bias, and precision. Input from corner load testing is entered also.

Balance-to-weight uncertainty ratios are automatically calculated. The total measurement uncertainty of the balance is calculated at one, two, and three standard deviations.

The automated reporting feature quickly pinpoints out-of-tolerance conditions for correction. Graphic charts display deviations in an easy-to-read format.

Westinghouse Savannah River Company is seeking companies interested in licensing the Balance Checker for the purpose of selling it as a commercial product.

More info: Russell Huffman, Building 773-41A, Aiken, SC 29808; 803-725-5788 or 800-228-3843; russell.huffman@srs.gov

Energy AFRL DEBRIS MONITOR

Potential engine bearing failures can now be diagnosed more reliably and quickly with cheaper and less bulky commercial-off-the-shelf monitoring equipment thanks to recent experiments by the Air Force Research Laboratory's Propulsion Directorate and the University of Dayton Research Institute (UDRI). Flight line use of unwieldy and costly scanning electron microscope systems may be a thing of the past—thanks to the more cost-effective alternative developed by UDRI.

The directorate's Mechanical Systems Branch and UDRI have developed a portable wear debris monitor that detects and identifies bearing wear debris in turbine engines. The device, based on x-ray fluorescence (XRF) technology, provides visual imaging, size measurement, and alloy composition determination.

This detailed information allows flight line laboratory personnel to track and identify wear debris taken from the engine's bearing sump chip detectors and take appropriate maintenance actions to prevent lubrication system failures.

The XRF instrument is bench-top size and could potentially replace scanning electron microscope (SEM) technology currently in use by the Air Force. The XRF would cost approximately 80% less than SEM instruments and weigh 72% less.

The system is ready for initial field testing verification of the risk algorithm accuracy and refinement of procedures.

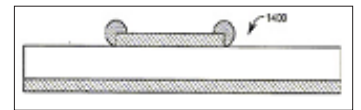
More info: www.pr.af.mil



Manufacturing Downsizing Design

An Air Force Research Laboratory (AFRL) Sensors Directorate invention provides for designing and manufacturing microstrip transmission lines for microwave and millimeter frequencies on integrated circuit chips.

The proposed transmission line has lower signal loss and requires less material to fabricate than the current method. The reduced material requirement is a significant cost factor because precious metals are used.



Cylindrical edge microstrip transmission line

The intellectual property for this invention belongs to the Air Force. There are no experimental data to specifically validate the patent claims, but extensive electromagnetic modeling has been accomplished. Also, the process to manufacture the cylindrical edges suggested in the patent has not been demonstrated. Additional development of suitable manufacturing processes is planned.

The market payoff for the technology is large in terms of improved electrical performance of circuits (loss reduced by 13-30%) and reduced cost for making the circuits (41% less material).

Patent Abstract

A transmission line arrangement provides control of signal losses through the use of *conductor cross-sectional surface area increasing* and *skin effect-considered bulbous additions* to the rectangular conductor cross-sectional shape frequently used in semiconductor device transmission line conductors. The transmission line is especially suited for use in radio frequency integrated circuit assemblies.

More info: Dr. Charles H. Krueger, 937-253-0217, or charles.krueger@wtn.org

Proven to Work

KCP'S NEEDLE-FREE INJECTOR WINS FLC HONORS

The DOE's Kansas City Plant (KCP) collected another FLC Excellence in Technology Transfer Award for its partnership with Felton International of Lenexa, Kans., and Russian companies, MedEquipment and Russki Most Management, in the development of a needle-free injector.

The KCP associates who worked to facilitate and provide the overall direction and technical support to turn this product into reality received their award May 7 at the 2003 FLC national meeting in Tucson, Ariz.

"We never started this process with the idea that we wanted to win a national award," Paul Quirk, project management specialist, said. "I'm just tickled that the judges were able to see the time, effort and validity of this project and reward us."

The needle-free system, known as the Pulse™ 200, has received FDA clearance for use in the swine production industry and does not use traditional needles and syringes to administer vaccinations. This eliminates the potential of needle fragments finding their way into the food supply and, in the case of the swine industry, improves overall meat quality by reducing meat tissue damage from injection site reactions and meat discoloration from bruising.

"We've implemented several practices on our farms to reduce the risk of foreign objects. However, the best way to handle a food safety risk is to eliminate the source," said Rod Brenneman, president of Seaboard Farms in Shawnee. "We're pleased to be the first pork producer to use needle-free



The needle-free injector presently used by Seaboard Farms in Shawnee, Kans. The Kansas City Plant partnered with Felton International of Lenexa, Kans., and a pair of Russian firms to develop a needle-free injector, which has been approved by the FDA for use on animals.

technology in swine production and to lead the industry in a direction that improves food safety and builds consumer confidence."

Providing fast, large-scale inoculations without spreading blood-borne pathogens is a longstanding veterinary and human healthcare challenge. Unsafe, needle-free injection systems have existed since the end of World War II. The U.S. military used them for vaccine delivery until the early 1980s, when they were banned after it was found they transmitted blood-borne diseases. This was also a familiar technology widely used throughout the former Soviet Union. Millions of citizens and Soviet soldiers received inoculations with needle-free injectors.

The advantages of needle-free systems over traditional syringe-and-needle systems were well-known — lower costs, faster delivery, reduced

pain, improved availability of vaccines, improved worker safety, and safer disposal of dangerous needles and related waste. The challenge was to solve the pathogen transfer problem while retaining the advantages of the needle-free injector system.

The technology transfer of a Russian-designed protector cap was the missing link needed to improve the safety found in this needle-free injector system. This protector cap provides three separate challenges to any pathogen transfer between patients. Each cap is packaged in a sterile container and exposed only immediately before injection. The cap is then disposed of after each use in a biohazard bag.

More info: www.kcp.com/index.html

International Transfer from page 1

security. For example, the United States has committed \$1.7 billion for the first five years of a long-term research and development program for hydrogen, hydrogen infrastructure, fuel cells, and hybrid vehicle technologies. The European Union has committed up to 2 billion euros to long-term research and development.

The use of hydrogen as an energy carrier offers several important advantages relative to existing systems. Hydrogen can be derived from multiple feedstocks, which fosters fuel versatility. End-use technologies that employ hydrogen, such as fuel cells and combustion engines, are more efficient and can be used safely while improving the environment and public health. Fuel cell vehicles may one day serve as sources of reliable, distributed electricity generation when not being used for transportation.

More info: Jeanne Lopatto, 202-586-4940

C.A.M.P. Commercialization Assistance Mentoring Program



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Lab in the Limelight from page 1

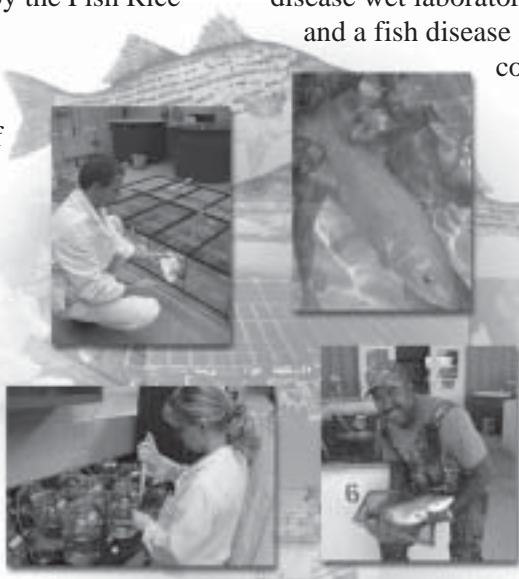
- Bird Depredation Research, including development of practical dispersal and barrier technologies for the control of fish-eating birds on fish farms.

History

SNARC was authorized by the Fish Rice Rotation Act of 1958, under the name U.S. Fish Farming Experiment Laboratory (FFEL), U.S. Department of the Interior. In 1958, 86 acres of land were purchased near Stuttgart, Ark. In 1961, an office building, laboratory, garage and fish-holding facility were constructed. The FFEL was officially dedicated October 21, 1962. Additional construction resulted in 86 ponds (ranging in size from 0.1-3 acres), a wet laboratory building, and a garage and two buildings for chemical and oil storage. In 1992, a state-of-the-art laboratory was added to increase the facility's research capability. In 1996, Congress transferred the center to the Agricultural Research Service, U.S. Department of Agriculture, as part of the Farm Bill.

Description

SNARC's research facilities include an 18,000-ft² bench research laboratory. The building includes space for computerized information retrieval and conference areas. Other laboratory facilities include a wet



laboratory equipped for multi-use aquaria and tank studies, with the capability of being supplied with several temperatures of well and pond water. An auxiliary building is equipped with a feeds manufacturing pilot plant, a fish disease wet laboratory with associated aquaria, and a fish disease laboratory. A newly

completed tank farm is equipped with 120 4-foot-diameter fiberglass fish holding tanks. Other buildings include a mechanical shop, personnel support building, a plumbing and metal fabrication building, a water filtration and purification plant, and various other storage buildings. Research pond facilities include

81 earthen ponds, in addition to 2 earthen raceways and a 27-acre water reservoir.

Water for the research ponds and wet laboratories is obtained from three deep wells with a total capacity that exceeds 2,500 gallons per minute.

Research

Bird depredation research at SNARC focuses on developing cost-efficient methods to minimize bird depredation within the aquaculture industry and resolving fish-eating bird problems with alternative solutions that minimize human-bird conflicts. Ongoing

research addresses concerns of baitfish and catfish producers in Arkansas. Bird depredation researchers are determining the efficiency of both lethal and nonlethal practices used within the industry, as well as new products entering the market.

Numerous bird species are studied. However, the primary birds of concern include the double-crested cormorant (water turkey), American white pelican, diving ducks, herons, and egrets.

Other research at SNARC includes:

- Cormorant population dynamics
- Cormorant dispersal
- Development of barrier technologies for catfish and baitfish farms
- Diving ducks food habits
- Drug regulations and therapeutics
- Evaluation and drug registration for catfish, trout and tilapia
- Evaluation and control of trematodes in catfish, sunshine bass and baitfish culture
- Improved live feeds systems for larval sunshine bass
- Development of practical diets for sunshine bass

More info: 870-673-4483,
www.snarc.ars.usda.gov



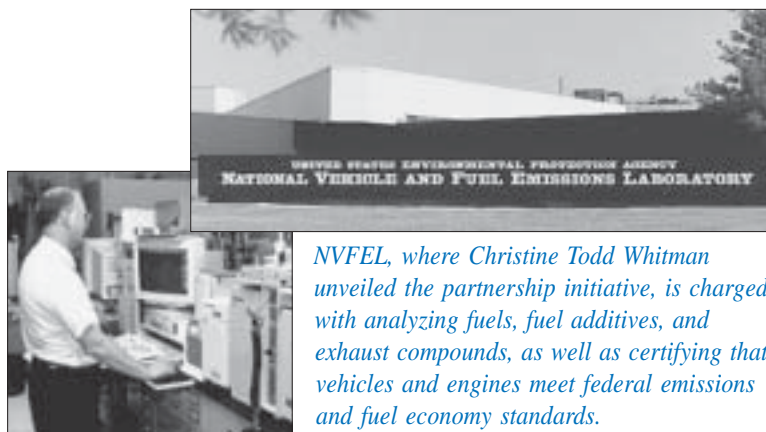
The information gathered by SNARC provides scientists with data to assess possible management plans for this bird.

EPA, UPS, Daimler from page 1

vehicles and the new hydrogen refueling station.

This partnership and the promising technologies of fuel cells and hydrogen fuel fit together with the EPA's overall strategy of protecting public health and the environment while reducing greenhouse gas emissions. This strategy includes the Clear Skies Act of 2003, the recent historic proposal for nonroad diesel engines, the Clean School Bus USA Initiative, and the SmartWay Transport program.

In his 2003 State of the Union address, President George W. Bush challenged America to move the country toward greater use of hydrogen as an energy source. His request for \$1.2 billion to support research into the development of efficient, affordable hydrogen



NVFEL, where Christine Todd Whitman unveiled the partnership initiative, is charged with analyzing fuels, fuel additives, and exhaust compounds, as well as certifying that vehicles and engines meet federal emissions and fuel economy standards.

fuel cells represents a significant investment in both energy self-sufficiency and environmental protection.

NVFEL is part of the Office of Transportation and Air Quality (OTAQ), which is responsible for carrying out laws to control air pollution from motor vehicles, engines, and

their fuels. OTAQ's mission is to reconcile the transportation sector with the environment by advancing clean fuels and technology, and working to promote more livable communities. OTAQ is divided between EPA's headquarters in Washington, D.C., and NVFEL in Ann Arbor, Mich. The laboratory's primary responsibilities include developing national regulatory programs to reduce mobile source-related air pollution from light-duty cars and trucks, heavy-duty trucks and buses, and nonroad engines and vehicles; evaluating emission control technology; and providing state and local air quality regulators and transportation planners.

More info: www.epa.gov/fuelcell

Inside the FLC

FLC Appoints Committee Chairs, Elects Coordinators

Sharon Borland of the Army Coastal and Hydraulics Laboratory has been appointed to the Program Committee Chair position vacated by Norma Cammarata of the Army Research Laboratory.

Mike Leavitt of the Idaho National Engineering and Environmental Laboratory has been appointed the Co-chair of the State and Local Government Committee.



Mike Leavitt

Susan Sprake of Los Alamos National Laboratory has been reelected as the Mid-Continent Regional Coordinator, with Jana Smith of the Rocky Mountain Oilfield Testing Center as Deputy Regional Coordinator, replacing the outgoing Vic Chavez of Sandia National Laboratories.

The Army Aviation and Missile Command's Kelly McGuire has been reelected as Regional Coordinator of the Southeast Region, and Carolyn McMillan of NASA Marshall Space Flight Center will be Deputy Regional Coordinator, replacing the outgoing Vice-Chair-elect Larry Dickens of Oak Ridge National Laboratory.



Kelly McGuire lectures during the 2003 FLC national meeting in Tucson, Ariz., May 5, 2003.

Hans Kohler of the Naval Air Warfare Center-Aircraft Division has been reelected as the Northeast Regional Coordinator. The appointment of the Northeast Deputy Regional Coordinator is forthcoming.

FLC Points of Contact

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FLC Northeast/Midwest Joint Regional Meeting

New York, N.Y. October 1-3, 2003

T² Training | T² Awards | Networking



FLC Southeast Regional Meeting

Charleston, S.C. September 17-19, 2003

Business Development & Commercialization and the Role of Federal Laboratories, Industry, and Academia

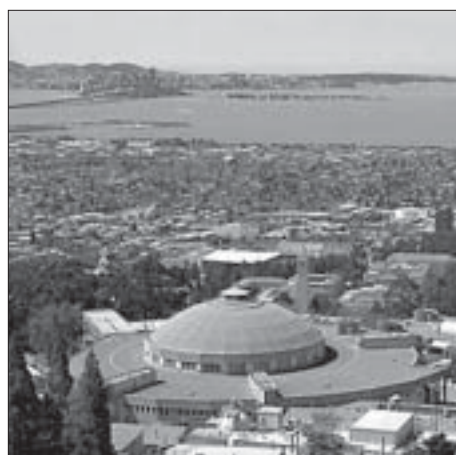
Licensing Decline from page 1

were responsible for \$1,064,000, and copyrighted software for \$364,000.

At LBNL, total income was \$1,374,000, of which royalties or fees from patents and TRPs constituted \$1,247,000, and copyrighted software produced \$127,000.

LLNL had total royalties or fees of \$2,489,000. Patents and TRPs contributed \$2,220,000, and copyright software \$269,000.

At the end of FY02, there were 218 active license agreements and 20 options in place. Patenting activity at the three national labs in FY02 was a mix, with overall invention disclosures decreasing 7% (from 359 to 334), while applications for U.S. patents grew 1% (from 330 to 341).



LBNL is one of three DOE laboratories that contributed to a 4% decline in licensing income for FY02.

U.S. patents issued to the labs grew 34%, with 211 granted to DOE inventions in FY02. Of these, LANL received 75, LBNL 31, and LLNL 105.

Although all three labs are managed for the DOE by the University of California, most of their patenting and licensing operations are handled by DOE offices at each site.

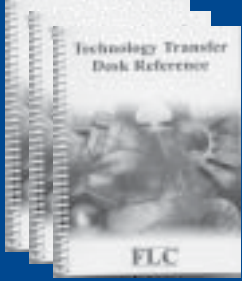
The portfolio of DOE lab inventions that the university's tech transfer office oversees generated additional DOE royalty and fee income of \$1,046,000 in FY02, including

\$285,000 for Berkeley and \$761,000 for Livermore.

Do the latest figures indicate any change in how national labs are performing their responsibilities under federal tech transfer legislation?

"I don't think these are indicative or meaningful [metrics] of that role," stated an official, who asked not to be named, told FTW last week. "At least two [of those labs] are sitting on technologies which could have lots of play in the homeland security area over the next year of two," he said.

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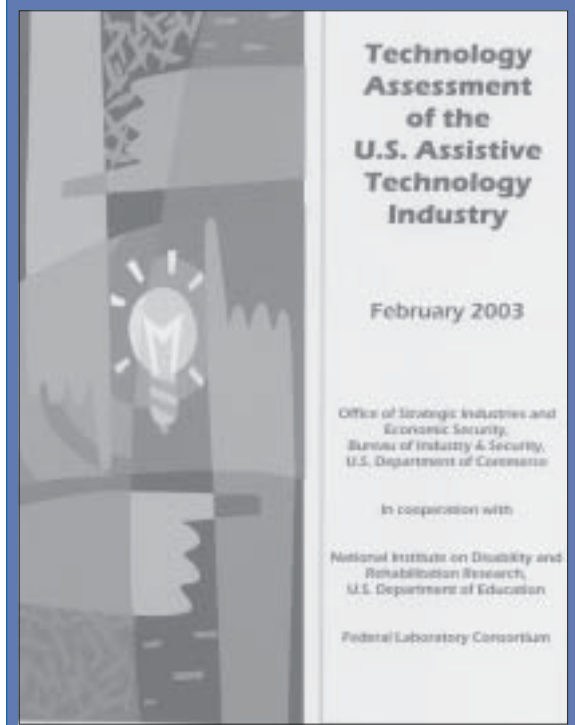
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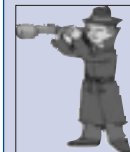
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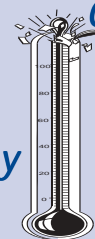
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