NEWSLINK

FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER FEBRUARY 2000 VOL. 16, NO. 2

Best Manufacturing Practices Program Sets Industry Standards

It is hardly incidental that the U.S. Navy's Best Manufacturing Practices (BMP) program has won the prestigious Innovations in American Government Award—or that its 118 surveys of manufacturing companies and organizations have expanded its database to 4,000 highly useful documented manufacturing practices. But even more important is the impact on attitudes that BMP has made in its 15 years of existence. Thanks to BMP's influence, industrial organizations, once protective of their own expertise, are now more willing to share their best manufacturing knowledge, insight, and experience.

Until recently, manufacturers—especially those in the heavily guarded defense industry—were reluctant to talk with competitors. "U.S. industry now realizes the need to share information in order to compete on a global level," says **Ernie Renner**, BMP Program Director. "More people want to incorporate lean manufacturing practices to be more efficient." In other words, companies want "to have the right thing in the right place at the right time. All work areas—personnel, shop floors, management—are adapting our industrial principles and using our resources," says Renner.

Problem-Solving Methods

Sponsored by the **Office of Naval Research**, BMP was created to overcome the wide and costly variances in the quality of goods and services that the Navy received from U.S. contractors. The Navy could see that military services, suppliers, and contractors were experiencing similar problems—and that the manufacturing process problems of one contractor could be solved by another. The solution was to get the contractors to exchange process improvement techniques and problem-solving methods. And those solutions— best practices—could be applied across the entire U.S. industrial base.

Sharing Information: To compete in today's global economy, U.S. manufacturers must share their best practices. The U.S. Navy's Best Manufacturing Practices (BMP) program helps make this possible. Ernie Renner (seated) serves as BMP's Director, and Anne Marie SuPrise is Deputy Director.

Out of BMP's Center of Excellence and 10 regional satellite centers, survey teams of technical experts from government, industry, and academia are matched to the disciplines of a factory or lab to determine that facility's best practices. For the unique 3- to 5-day process– *not* an audit—the organization presents what it does best, and the survey team verifies each practice. The team then writes a review (a two-way exchange, but each facility controls the report info), and the resulting best practices go into a survey report and a cumulative database that is continually updated.

Lean Standards

Litton Guidance and Control was the first company surveyed. Once the word was out, industrial facilities such as **Dayton Parts, Rockwell Collins, Lockheed Martin**, and **JLG Industries** began to request surveys. According to **Sam Swope**, JLG's Vice President of Human Resources, JLG used the survey as a benchmarking tool against industry competitors—and has noticed both improved company visibility and pride.

Now recognized by the broad U.S. manufacturing community, BMP is working on penetrating the auto industry through a partnership with the **Society of Automotive Engineers (SAE)** on an initiative that will help set lean manufacturing standards for OEMs and suppliers. In turn, SAE is helping to institute these standards in the aerospace industry. BMP is also working with the **U.S. Air Force** and the **Massachusetts Institute of Technology** to develop

*Please see **BMP**, p. 2*

INSIDE

This issue of *NewsLink* focuses on **MANUFACTURING**. Next month will focus on biotechnology.

BMP from p. 1

lean manufacturing methods and participating in *Industry Week*'s selection of the top 10 industrial plants in the U.S.

The word *must* be out—the BMP web site is averaging 16,000 general hits and 900+ users a day! NL

For more info: 800-789-4267, www.bmpcoe.org

BMP Manufacturing Guidelines

Download these free guidelines from BMP's Electronic Library (located at www.bmpcoe.org).

- *How to Be Green and Stay in the Black*
- *Producibility System Guidelines for Successful Companies—The Five Steps to Success*
- *Operating Equipment Asset Management—Your 21st Century Competitive Necessity* (coming soon)

Subscribe to the FLC's new environmental e-mail newsletter!

The FLC is launching a free e-mail newsletter focused on environmental technologies, facilities, and resources available from federal labs. Topics covered will range across a wide variety of industries and environmental areas.

To subscribe, send an e-mail to jbegley@utrsmail.com and type "Environmental E-Mail Newsletter" in the subject line.

Corrections

The December 1999 issue of *NewsLink* included some incorrect information. Here is a list of corrections.

- **Fed Labs Flash:** The correct phone number for the U.S. Army Climatic Testing Chambers is 508-233-5295.
- **Spotlight on Success:** Dr. Jerry Crawford of the USDA's Eastern Regional Research Center can be reached via phone at 215-233-6610 or 215-233-6628.
- **Statistics on Foodborne Diseases:** Only 1% to 10% of foodborne illnesses are reported (vs. "one in 10 incidents of foodborne illness is not officially reported"), and although the incidence of reported illnesses has risen in the last 60 years, there is no official connection to the increased eating out habits of Americans today.

BMP Adds Visibility and Competitiveness to Federal Labs

The Navy's BMP program is not just for industry—federal labs are also using it. Because of this, the labs have begun to change their closed-door philosophy and become more competitive. At least 10 federal labs with tech transfer activities have been surveyed by BMP—in addition to numerous Navy shipyards and depots, Army arsenals, and munitions facilities—even the **USS Carl Vinson**. "We refer companies to the federal labs," says **Ernie Renner**, BMP Program Director. Besides recognition from the U.S. industrial base, the labs also benefit individually.

NUWC Division Keyport

After its BMP survey, **Naval Undersea Warfare Center (NUWC) Keyport** received calls from people who had read the BMP database. Most callers were seeking advice, says **Michael Lehman**, Technology Development and Electronic Fabrication Division Head. Although it took time and resources to prepare for the survey—which included presentations, demos, tours, and making people available—Lehman says the survey "validated some of the things we were doing and helped us realize that some of what we thought were best practices were not unique." NUWC Keyport came away with good suggestions, and "the resulting improvements increased our competitive stance."

NASA Marshall

NASA Marshall Space Flight Center participated in two BMP surveys. The second one, held in late 1999, was "an extensive examination to identify and update potential world-class practices for the BMP network and reevaluate those that are not up to that level," says **Larry Lechner**, Assistant Director (ret.), Tech Transfer Program.

"The price is right—free!" The main investment is time, Lechner explains. But the returns are multifold: "due recognition and a means to discuss our processes with others in similar areas," a valuable means for transferring important technology, a chance to showcase world-class processes and practices, and the opportunity to benchmark against the best in class throughout the country.

Labs Evaluated So Far

To date, BMP has surveyed the following federal labs:

- Army Combat Systems Test Activity, Aberdeen, MD
- Lawrence Livermore National Lab, Livermore, CA
- NASA Kennedy Space Flight Center, Cape Canaveral, FL
- NASA Marshall Space Flight Center, Huntsville, AL
- Naval Air Warfare Center, Indianapolis, IN (now Raytheon)
- Naval Air Warfare Center, Lakehurst, NJ
- Naval Surface Warfare Center, Crane, IN
- Naval Undersea Warfare Center, Keyport, WA
- Oak Ridge National Lab, Oak Ridge, TN
- Sandia National Labs, Albuquerque, NM. NL

FED LABS FLASH

Technology transfer news, notes, and events within the federal lab community

DOE Launches Physical Science Research Site

The **DOE Office of Scientific and Technical Information** has just developed PubSCIENCE (www.osti.gov/pubsci)—a web-based tool for researchers and the public who need to access info published in peer-reviewed journals in the physical sciences and other energy-related disciplines. The **Government Printing Office (GPO)** is sponsoring public access of PubSCIENCE. Modeled after the **National Institutes of Health's (NIH)** PubMed, PubSCIENCE allows users to search—at no cost—across abstracts and citations from more than 1,000 scientific and technical journals from more than 20 participating publishers. Once info of interest is identified, a hyperlink provides access to the publisher's server for the full-text article. Users with journal subscriptions will see the full-text article immediately; nonsubscribers can access the full text via pay-per-view, special arrangement with the publisher, library access, or commercial providers.

For more info: Dr. Walter L. Warnick, 301-903-7996

U.S. National Atlas Available on CD-ROM

The **U.S. Geological Survey (USGS)** has released the "Digital Atlas of the USA" on CD-ROM—the first time a comprehensive version of the National Atlas has been released in this format. An ongoing project since 1970, the National Atlas CD-ROM includes data layers compiled by USGS, elevation and geology information, more than 500 MB of raw data, and animation software that shows plate tectonic movements. A full version of the CD-ROM can be purchased for $45 from CD Vision, Inc. (www.cdvision.com).

For more info: 888-ASK-USGS, www.nationalatlas.gov

AFRL Materials Degradation Test Facility

The **Air Force Research Laboratory (AFRL) Materials Degradation Test Facility** (Wright-Patterson AFB, OH) can evaluate a wide range of applications for erosion resistance with pre- and post-test characterization. Currently, a CRADA with the **University of Dayton Research Institute (UDRI)** allows UDRI to perform materials degradation testing for nongovernment sponsors. Two features that can be accessed under the CRADA include the Rain Erosion Test Facility (which simulates subsonic flight at constant rainfall) and the Particle Erosion Test Apparatus (which simulates dust erosion effects on aircraft surfaces). Additional testing of materials performance in response to environmental exposure—including aerospace and space simulation—is available upon request. All test rates are subject to annual review.

For more info: www.ml.afrl.af.mil/facilities/mdtf/default.htm

Free Service Makes Finding SBIR Funding Easier

A free service offered by the **DOE's Pacific Northwest National Lab** consolidates and delivers news about the government's Small Business Innovative Research (SBIR) program right to your desktop—helping small businesses eliminate the time-consuming and burdensome task of searching for funding. Announcements are sent via e-mail or fax, and past notifications are posted on a web site. Subscribers also receive info on upcoming workshops and tips on writing proposals. Currently, 700+ people subscribe to the service. In 1999, the service won the National Partnership for Reinventing Government Award for streamlining government and improving customer service.

For more info: www.pnl.gov/edo/grow/subscript.stm

New Federal Nanotechnology Initiative

During a January 21 speech at the **California Institute of Technology**, **President Clinton** announced a new "National Nanotechnology Initiative"—which will increase overall federal funding for nanoscience and nanotechnology R&D by 84% to $497 million beginning FY2001. Nanotechnology is expected to revolutionize the production of virtually every human-made object and usher in a new technology revolution. For example, nanotechnology would make it possible to fit the entire contents of the **Library of Congress** onto a device the size of a sugar cube. The bulk of the initiative's funding ($217 million) will go to the **National Science Foundation**—followed by the **DOD** ($110 million), **DOE** ($96 million), **NIH** ($35 million), **NASA** ($20 million), and the **Department of Commerce** ($18 billion).

Funding for Innovative Transportation Concepts

Looking for start-up funding for promising but unproven concepts in surface transportation systems? Consider the **IDEA** program (Innovations Deserving Exploratory Analysis)—whose goal is to seek out and support new transportation solutions unlikely to be funded through traditional programs. Managed by the **National Research Council's Transportation Research Board**, IDEA projects typically generate innovative solutions to critical issues in four areas—highway, high-speed rail, intelligent transportation systems (ITS), and transit. IDEA is open to all individuals, entrepreneurs, and inventors from small and large businesses, for-profit and not-for-profit organizations, public and private universities and colleges, research institutions, public transportation agencies, and state and local governments. NL

For more info: www4.national-acdemies.org/trb/dive-idea.nsf, 202-334-3301

TECHNOLOGY WATCH

Federal laboratory technologies available for technology transfer

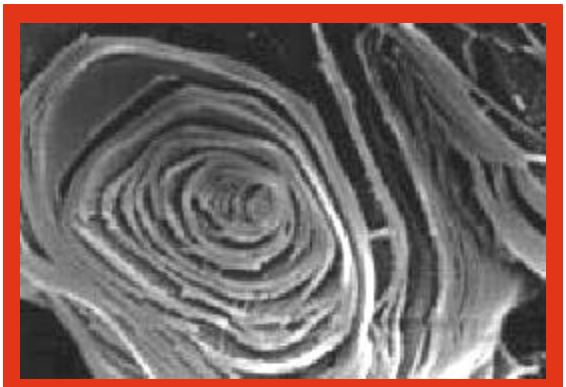
Revolutionary Manufacturing Process for Metal Composite Parts

A joint effort of the **Air Force Research Laboratory (AFRL) Materials and Manufacturing Directorate** and **Metal Matrix Cast Composites, Inc. (MMCC)** has resulted in a manufacturing process that could revolutionize and mature metal composite parts fabrication. Developed by MMCC, the Advanced Pressure Infiltration Casting Process (APIC™) allows computer-aided design (CAD) drawings to be turned into high-quality, finished products in a matter of days. The process expands rapid prototyping so that new design concepts demanding lightweight, low profile, stiffer materials can be quickly manufactured and evaluated. The result is that durable parts can be manufactured at just half the weight and at a much lower cost. Besides being used to serve the national defense, space, and supporting industries (such as telecommunication space satellites, aerospace electronic devices, and military armor), APIC-related R&D is also being supported by the **Navy**, the **Defense Advanced Research Projects Agency (DARPA)**, and **NASA.**

For more info: David Judson, 937-255-7371

Environmentally Friendly Lubricant for Automotive Metal Forming

One of the best ways to increase a vehicle's fuel efficiency is to reduce overall weight by using lightweight aluminum- or magnesium-based alloys. But forming these alloys into automotive body parts is very difficult—mainly because of the high friction of the alloy surfaces and the extreme conditions required for metalworking. Also, most conventional lubricants are flammable and potentially hazardous—requiring difficult and costly disposal processes. However, scientists at the **DOE's Argonne National Lab** have discovered that boric acid, used as a lubricant, is one of the most slippery solids around—with friction coefficients one-fourth to one-sixth the value of other more expensive solid lubricants. This prevents aluminum- and magnesium-based alloys from sticking or transferring to the die or roll surfaces. "Boric acid is a cheap, abundant, and environmentally friendly substance that greatly reduces friction and wear of dies and molds and, at the same time, provides an ultrasmooth surface finish on final products. After metal forming operations, parts can be rinsed in water to remove excess lubricants—no toxic or flammable solvents are necessary," says principal investigator **Ali Erdemir**. The use of boric acid also decreases the unit cost for auto parts because the near-perfect finished products don't require secondary machining or grinding. Argonne—in cooperation with aluminum manufacturers—is currently working on identifying specific problems in aluminum-forming operations and testing a series of boric acid formulations under shear and stress conditions.



Slippery Solid: Argonne National Lab has found that boric acid—whose layered crystal structure is shown above—is an environmentally friendly lubricant for automotive metal forming.

For more info: Ali Erdemir, 630-252-6571, erdemir@anl.gov

A Laser Ruler for Paint Films

A new laser-based measurement technology—developed by the **Autospect Division** of **Perceptron Corp.** with cost-shared funding from the **National Institute of Standards and Technology's Advanced Technology Program**—may solve a vexing problem on auto assembly lines—measuring paint thickness. Many variables (such as temperature and fluid flow) affect how paint is applied to auto bodies, but the process cannot be improved until the amount of paint on the car is actually measured. Currently, such measurements are made after several layers of paint have been sprayed and dried, and only two cars can be assessed each day because some 250 individual measurements are required per car. Thus, only a tiny fraction of the production line can be checked—far too few to gather adequate process control data. By the time a problem is uncovered, it has already affected hundreds of cars. The new technology is a non-contact, nondestructive probe that uses "laser ultrasonics." With the new technique, engineers expect to make 100 measurements per second per 100 cars under production conditions.

For more info: Michael Baum, 301-975-2763, michael.baum@nist.gov

Computer-Aided Design/Engineering Facility

The **U.S. Army Edgewood Chemical Biological Center's (ECBC)** Computer-Aided Design/Engineering (CAD/CAE) facility provides design, analysis, and prototyping services using state-of-the-art equipment and sound engineering principles. The facility maintains the latest technologies to execute complex projects—including sophisticated 3D scanning hardware and software to rapidly generate CAD models from existing items. By evaluating production possibilities and design issues, engineers can help manufacturers avoid development limitations and reduce development time and production costs. In addition,

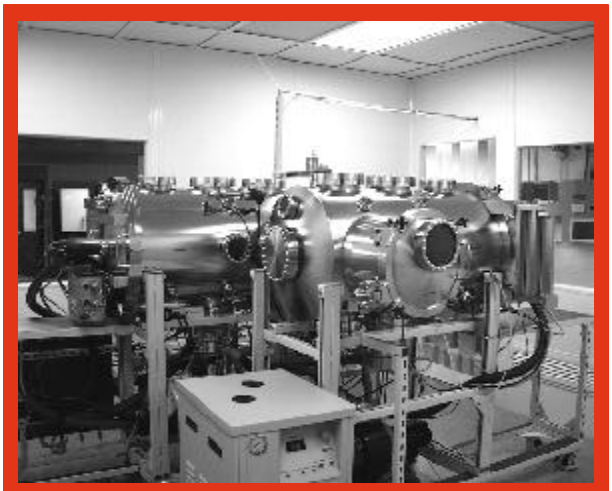
TECH WATCH *continued*

advanced rapid prototyping and computer-aided manufacturing (CAM) technologies allow the team to go directly from the computer screen to an actual working model. A multifaceted analysis service can conduct several types of examinations, including static, dynamic, thermal stress, kinematic motion, and tolerance. In addition, "virtual prototypes" can be created to visualize models and assemblies before fabrication. Although the facility primarily supports military missions, commercial manufacturers can use the facility to rapidly design and prototype models. To learn how one small business took advantage of the facility's services, see Spotlight on Success on p. 7.

For more info: Allyson Miller, 410-436-8784, allyson.miller@sbccom.apgea.army.mil

Unique, Patented Process Yields High-Quality Capacitors

Under the Air Force's SBIR program, the **AFRL Propulsion Directorate** and **K Systems Corp**. (Beavercreek, OH) have developed a new manufacturing technology for producing high energy density diamond-like carbon (DLC) capacitors. The unique process produces extremely high-quality DLC thin films on both sides of capacitor grade aluminum foil; the films have high dielectric strength, high resistivity, high decomposition temperature, chemical inertness, great hardness, and good thermal conductivity. In addition, the DLC films are optically smooth, flexible, pinhole free, and can be rolled into a tubular form. The capacitors' compact design offers: at least a 50% decrease in size, weight, and volume; a greater than 50% increase in temperature capability; and a twofold increase in energy storage density over equal value capacitors built with existing technologies. In addition, the tubular form lends itself to large-scale, low-cost manufacturing technologies. Potential commercial applications could be found in domestic utilities and appliances, well drilling equipment, power supplies, aircraft, trains, automobiles, and medical devices.



This Dual Ion Beam Deposition System is instrumental to a unique process that yields high-quality diamond-like carbon capacitors. The technology was developed under the Air Force's SBIR program.

For more info: Kristen Schario, 937-255-3428, kristen.schario@wpafb.af.mil

Composite Manufacturing at NASA Marshall

Technology to produce stronger, lighter weight composite materials developed at **NASA Marshall Space Flight Center (MSFC)** for use in the Reusable Launch Vehicle (RLV) program is available to U.S. industry through MSFC's Technology Transfer Office. At MSFC's Productivity Enhancement Complex, automated composite fabrication systems can work precisely with many different types of material—including glass, Kevlar, and carbon/graphite fibers. Specialized machines are available for:

- **filament winding**—lays down ribbons of resin/fiber composites
- **pultrusion**—pulls resin through a die to shape it
- **tape laying**—lays tape on flat or contoured surfaces with greater control and precision than manual methods
- **fiber placement**—allows resin/fiber tapes to be deposited in patterns that can be narrowed or expanded
- **tape wrapping**—was adapted to produce nozzles that burn solid and liquid fuels.

Potential commercial uses for composites include sporting goods manufacturing and the commercial transportation industry.

For more info: Sammy Nabors, 256-544-5226, sammy.nabors@msfc.nasa.gov

Oak Ridge Centers for Manufacturing Technology

The **DOE's Oak Ridge Centers for Manufacturing Technology (ORCMT)** were established to help maintain national security capabilities while bolstering U.S economic competitiveness in numerous manufacturing sectors. Serving as a catalyst for applied research, development, design, prototyping, production, and training, ORCMT is located at the **Y-12 Defense Production Plant** in Oak Ridge, TN. Combining the best scientific, technological, engineering, and manufacturing capabilities of the Y-12 Plant and **Oak Ridge National Lab,** ORCMT offers unique and highly specialized products and services not available in the private sector. Companies can choose from a variety of options, including:

- **Work for Others**—you pay ORCMT to solve problems, make prototypes, or do R&D
- **User Facility Agreements**—do your work on the site assisted by ORCMT technical staff
- **CRADAs**—join with ORCMT to do R&D on a problem of mutual benefit
- **Manufacturing Skills Course**—your technical and craft workers receive advanced training (at ORCMT or your site) via specially designed short courses and workshops
- **Technical Assistance**—check your eligibility for special short-term assistance to solve tough manufacturing problems.

For more info: 800-356-4USA, www.ornl.gov/orcmt

***TECH WATCH** continued on p. 6*

TECH WATCH continued from p. 5

Brookhaven Collaborates on New Technique for Making Microscopic Machines

Although micromachines are one of the most promising technologies of the 21st century, the techniques used to make them are expensive and time-consuming. However, scientists at the **DOE's Brookhaven National Lab** and **Standard MEMS, Inc.—**a manufacturing facility in Hauppauge, NY—are collaborating on a revolutionary microfabrication technique that promises to be more economical than current approaches and more likely to produce cost-effective devices.

Until recently, 3D microfabrication (also called high-aspect-ratio microfabrication) required the use of synchrotron X-ray beams and masking materials that can block X-rays. The high cost of an X-ray mask and the small number of synchrotron X-ray sources limit the use of this technique. (Early microfabrication techniques, which were developed for computer chips and integrated circuits, are limited primarily to 2D designs and silicon-based compounds.) However, through a CRADA, Brookhaven and Standard MEMS are optimizing a process to manufacture 3D microstructures with a specialized UV-sensitive material to achieve results similar to those produced by X-rays. The process could easily be incorporated into existing manufacturing systems at silicon foundries (like Standard MEMS), which are accustomed to working with UV exposure sources. According to Brookhaven materials scientist **John Warren**, the new technique would allow more rapid design, testing, and refining of microstructures—"You can do in weeks what would have taken months."

"Once we fully understand the processing parameters of this technology, then many products will undoubtedly be based on it," says Warren. Some possibilities include sensors for various types of energy (UV and infrared rays), micro-actuators, mechanical movers, and biomedical applications.

For more info: Dorry Tooker, 516-344-2078, dorryt@bnl.gov NL

Don't see what you're looking for?

Looking for a specific technology or facility at a federal lab? Submit a Technical Request to the **FLC Laboratory Locator**, who will find the answers you need—at no cost! Go to the FLC web site at *www.federallabs.org* and click on LOCATOR or call 888-388-5227 or 856-667-7727.

Technology Transfer on the World Wide Web

Dual Use Science and Technology Program
www.afrl.af.mil/dualuse

Go here to get the latest info on the **DOD's Dual Use Science and Technology (DU S&T) Program**—a program cosponsored by the **Army, Navy**, and **Air Force** in which industry bears 50% of the cost to develop a technology with military and commercial applications. In November, the Air Force announced it was adding new topics for FY2001. Proposals are due April 28, 2000.

Manufacturer's eBusiness Network
www.mfgnet.com

Founded in 1997, this site serves the needs of manufacturing and technology companies from Minnesota and across the country. Offerings include Internet information services, technology consulting services, e-business research, and e-business systems integration. Originally funded by grants from **Minnesota Technology, Inc**. and the **U.S. Department of Agriculture (USDA)**, the eBusiness Network now sustains operations through cost participation programs.

AFRL Material and Manufacturing Reports
www.ml.afrl.af.mil/publications/psr/PSR-1999-Wi-web.pdf

Go here to download a PDF version of the **AFRL Manufacturing and Materials Directorate's** winter 1999 status reports. Headlines include: "Defense Production Act Title III Program Awards Contracts for Silicon Carbide Substrates," "ManTech Initiative Seeks Ways to Manage Electronic Parts Obsolescence," and "Casting Supplier Initiative Speeds Manufacturing Technology Improvements."

Human Nutrition, Food Freshness, and Safety
www.ars.usda.gov/is/np/fnrb/fnrb012000.htm

Go here to access the latest issue of *Nutrition Briefs*—a quarterly newsletter from the **USDA's Agricultural Research Service (ARS)** containing the latest ARS findings on human nutrition, food freshness and safety, and new foods and varieties.

Wood in Transportation
www.fs.fed.us/na/wit

Need up-to-date, comprehensive information about the use of wood in the construction of transportation structures? Then check out the **National Wood in Transportation (WIT) Information Center's** web site, which contains valuable info about the **USDA Forest Service** WIT program, available publications, grant opportunities, events, and links.

National Transportation Library
http://ntl.bts.gov

With 5,300+ full-text documents, a search engine that indexes 110,000 documents from 14 transportation agencies, and a document collection that includes **U.S. Department of Transportation (DOT)** reports and material from 30+ state DOTs and university web sites, the **National Transportation Library** offers one-stop shopping for transportation info.

Have a suggestion for a tech transfer web site?
Send an e-mail with the URL to jbegley@utrsmail.com

SPOTLIGHT ON SUCCESS

Success stories from the federal lab community

Accidental Meeting Leads to Big Success

What do you get when you cross a small start-up company with the **U.S. Army**? A new player with modest resources that can now go head-to-head with seasoned, wealthier competitors.

The Challenge

Super Innovative Concepts, Inc. (SIC)—a Maryland-based firm specializing in the design and manufacture of exotic bicycle parts—was founded in 1997 by **Trevor Combs**, a mountain bike enthusiast who wrote his master's thesis on a design approach for bicycle components. A sculptor and artist dedicated to designing distinctive parts for competitive bikes, Combs wanted his company to "push the envelope of manufacturing capability" by using the most current production methods to manufacture leading-edge designs.

SIC's first product was to be the "Cloud 9 Stem"—a state-of-the-art bicycle stem with an eye-catching design that would provide riders with optimum performance. With its unusual shape, Combs knew the stem would be difficult to manufacture. He needed a firm talented and dedicated enough to manufacture the part—and he needed it fast, in time for upcoming cycling trade shows. For the past two years, Combs had attended the shows with only soft foam models; this year, he wanted a working prototype of the Cloud 9 Stem in hand.

An Accidental Meeting

Combs met up with the Army by accident in late July 1998. One day, a woman stopped by the shop to admire drawings of the stem lining SIC's windows. Learning of Combs' desire to have the drawings fabricated, she put him in touch with her husband, who happened to be a Technology Transfer Advisor at the **U.S. Army Edgewood Chemical Biological Center (ECBC)** in Maryland. The Center's technology transfer program allows for the transfer of federally funded experience, equipment, intellectual property, and facilities into the private sector for commercial purposes—a perfect way for small start-up companies like SIC to gain access to a wealth of technology.

Home to a number of specialized facilities and labs, ECBC determined that Combs' needs could best be met by ECBC's Computer Aided Design/Engineering Facility (see description on p. 4). **Randy Young**, the lead engineer on the SIC project, recalls that a team of CAD engineers initially met to discuss whether to take on the task of manufacturing the stem. Because Combs had created a geometrically complicated design, producing the Cloud 9 Stem was a great challenge. Although it was a tough job, the CAD team was excited by the prospect of fine-tuning their skills and helping a small company like SIC get a head start. Incredibly, the CAD team delivered a prototype stem to Combs within a month—just in time for the Interbike Las Vegas Show.

The Success

Since Cloud 9's unveiling, SIC has achieved new success—receiving acclaim in both national and international trade publications. Of SIC's relationship with the U.S. Army tech transfer program, Combs enthusiastically states "being involved with the Technology Transfer Program has made it possible for a small company like ours to compete with the world's largest bicycle manufacturers, who have tremendous resources. The leading-edge technology and world-class talent found in U.S. engineering facilities has enabled us to assume a leadership role in our industry that ordinarily would not be possible without a tremendous capital expenditure."

ECBC knows how difficult it can be for start-up companies to launch new products and effectively compete with bigger, wealthier competitors. Through its tech transfer program, ECBC gladly provides the economically attractive support necessary to help a smaller fellow stay in the race. For more info about how ECBC can help you, call 410-436-8784 or 410-436-5386. NL

For more success stories, visit the FLC web site at www.federallabs.org

Exhibit Passes to SAE and NDES!

If you're interested in attending the exhibits at the upcoming **Society of Automotive Engineers (SAE)** or **National Design and Engineering Show (NDES)**, let us know—we'll send you an exhibits pass.

SAE	NDES
March 6-9	March 13-16
Detroit, MI	Chicago, IL

To get your passes, send an e-mail (jbegley@utrsmail.com) or fax (856-667-8009) with your name, mailing address, phone, and number of passes needed for each show. See p. 8 for more info on the shows.

COMING ATTRACTIONS

March 6-9, 2000

Society of Automotive Engineers (SAE)

Detroit, MI

With a theme of "Adding Value to Life Through Technology and Advanced Mobility," this year's expo will feature the latest auto technologies from more than 900 companies and organizations from around the world, while the conference offers a wide spectrum of technical courses on all aspects of auto engineering. Be sure to visit the FLC in Booth 1765.

www.sae.org/congress/index.htm

March 9-11, 2000

Linking Technology with Business Strategy

Orlando, FL

Sponsored by the Technology Transfer Society and the Product Development and Management Association, this conference will share best practices plus cutting-edge tools and techniques for linking technology to business strategy. Session topics include e-commerce, making workable technology alliances, managing innovation and creativity, and reducing time to market.

800-232-5421 or www.pdma.org

March 13-16, 2000

National Design Engineering Show

Chicago, IL

Are you ready for the new century? The new global economy? New manufacturing shaped by technology-driven change? How will you keep up with all the advancements in components, computers, materials, and tools used in OEM product development? Stay ahead of the curve by attending the National Design Engineering Show. Be sure to visit the FLC in Booth 479.

www.manufacturingweek.com

March 26-30, 2000

BIO 2000

Boston, MA

Network and plug into the latest developments in the biotech industry as more than 5,000 industry leaders and executives from around the globe gather at the biotech industry's premier trade show. More than 500 exhibitors will be on hand with the latest biotechnology developments. Be sure to stop by and visit the FLC at Booth 3411.

www.bio.org/events/2000/bio2000.html

May 8-12, 2000

FLC National Meeting

Charleston, SC

Mark your calendars and plan to attend the FLC's 2000 National Meeting. With a theme of "Show Me the Way," the meeting will feature tech transfer training (beginner and advanced), sessions on how to use the FLC to advance your lab's tech transfer efforts, and many networking opportunities. Don't miss the first FLC meeting of the 21st century!

Sherry Nacci, 856-667-7727 x120, snacci@utrsmail.com

July 20-22, 2000

Tech Transfer Society Annual Meeting

Austin, TX

With a theme of "Sitting on the Hot Seat: Technology Transfer for the New Millennium," the Technology Transfer Society's 25th annual meeting will bring together technology managers from government, industry, and academia; researchers; venture capitalists; policy makers; and product developers.

Frank Penaranda, 301-593-6742, frankpen@erols.com

NEWS

950 North Kings Highway
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