ForwardFocus

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Montana Manufacturing Center | University Technical Assistance Program

Spring 2005

Inside this Issue:

Now with a NEW LOOK!

Innovation Sprouts from Lifetime of Soils Research

By Deborah Nash, MMEC

Automating production is the latest step in the long road from research to commercial reality for an innovation developed by Earl Skogley, a soil scientist and entrepreneur, at UNIBEST Inc. (Universal Bioavailability Environmental/Soil Test) west of Bozeman. The device is a cherry-tomato-sized capsule, filled with unique resin beads, that can change the way soils are analyzed. This technology allows direct measurements in the field, reducing the amount of material transported and handled in the laboratory. It simplifies and improves data collection for agricultural, environmental, and reclamation efforts in soils, water, or other media.

Data Needed

To learn how to scale up production cost-effectively and have solid data to submit for a "Growth through Ariculture" proposal to the Montana Department of Agriculture, Skogley, who retired from Montana State University in 1998 after 35 years of service in the College of Agriculture, naturally turned to the University. This time, he tapped expertise from several groups at the College of Engineering to explore feasibility, cost estimates, and a prototype design for a custom-built machine to increase capsule production.

Resin technology for soils research has been a lifetime passion for Skogley. The capsule is based on his doctoral research work on resins four decades earlier and shaped by his experiences as an MSU scientist. In addition to teaching duties, he conducted research, primarily in soil fertility and crop nutrition, and conducted field plots all over the state of Montana.

The Yellowstone National Park fires of 1988 provided some of the early field tests for the capsules where effects of forest burning were studied over two and a half years, Skogley said.

The PST-1 capsules for studying agricultural soils hold resin beads that take up ions from the soil by the same processes that plants use to get their nutrients. The capsules are returned to the lab after a designated time period to examine the inorganic contents that collect within the beads. This simple, accurate measure of availability of elements to a plant, gives agriculturists a way to identify nutrient deficiencies or imbalances, and serves as an aid to diagnosing problems. It can also assist long term crop management planning.

Traditional Methods

This innovation changes long-standing laboratory methods and will require new regulatory protocol for some uses, which has slowed its path to market. Traditionally, a soil sample of a pint or two is removed from a plot, dried, and then ground into powder. A small portion of this sample is then extracted with selected chemical solutions to determine how much of certain nutrients can be removed from the soil in this manner. This does not represent the processes used by plants to get their nutrients, so many years of "statistical correlation" studies have been conducted to learn how to use these data for crop management decisions. This methodology has been used for 60 or 70 years, and there is strong resistance to change, Skogley said. "We knew that standard soil testing was not realistic, not how plants work, but it was the best technology available. It pushed us to develop a more realistic system of soil testing based on true nutrient availability processes."

Earl Skogley demonstrates the automated process that increased production 30-fold.

The improved system requires only the insertion of the resin-filled capsules into the soil. They are later removed and taken to the lab for analysis. The resin is capable of adsorbing and storing ions over time for a more complete look at what is happening in soil under the actual conditions of plant growth, Skogley explained. About 100 capsules make up the weight of a single traditional soil sample, and capsules are easily disposed of after use. When testing near the soil surface, no special equipment is needed, but for deeper sampling, a soil access

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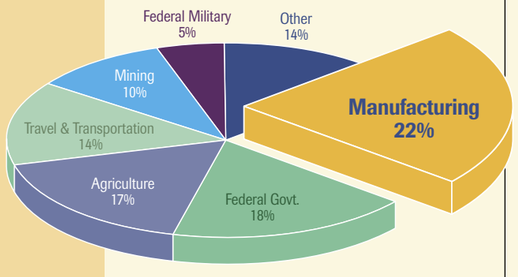
Shhhhhh! Don't tell anyone

Have you noticed that attention to the value of manufacturing in the state's economy often comes only when there is negative news like when a larger firm leaves an area.

Montana has more than 2,300 manufacturing companies. Manufacturing pays better than average wages. It pays over a billion dollars in wages each year, and produces approximately $5 billion in annual output. Here in Montana, *manufacturing is more than you might think*.

A new report "Building a Stronger Montana Technology Economy," released by the Montana Governor's Office of Economic Opportunity, shows that the leading sector in a promising Montana Technology Economy, based on wages paid, is **Advanced Manufacturing**.

Bit by bit a technology business community has emerged as an asset to improving the state economy. The Advanced Manufacturing piece makes up almost a third of the total manufacturing firms in the state. Koppel Group, LLC, which conducted the study,



identified 695 companies in Advanced Manufacturing. The average wage in this group is $45,000, much higher than the average state wage of under $27,000 and considerably higher than the state's average manufacturing wage of $35,000.

Other sectors that make up the technology community are **Information Technology** (759 companies; average wage $39,000) and **Life Sciences** (103; averaging $36,000). All three groups are small. Only 40 have more than 50 employees, the report said, adding that what gives this emerging economy more potential is that, despite size, a number of industry leaders and significant infrastructure support are already in place.

Several clusters are energizing Advanced Manufacturing: laser photonics, electronics technology development, and aerospace among them, and research conducted at Montana State University and the University of Montana supports both life sciences and advanced manufacturing.

An interesting thing surfaces from this report: The diversity and totality of the *state's technology assets ... more than you might think*.

Here at the Center, we continually work to elevate the image of manufacturing, and our workshops and biennial conference, Compete Smart, encourage time with manufacturing peers, because we have sensed the lack of awareness of and interaction with other companies and organizations in the state. The Technology Economy study bears out the need for this visibility across the sectors it examined.

It recommends a marketing approach such as proactive promotion, relationship building, and getting more involved in organizations that offer best practices to catalyze growth in this technology economy. While the recommendations are intended to help the state identify avenues to move this public/private technology model forward, they are important for manufacturing as a whole. Participation in the Montana Manufacturing Council at the State Chamber of Commerce and regional groups is imperative to build a voice and forge relationships.

Instead of Shhhhh! Don't tell anyone, shout, *"Montana Manufacturing...it's more than you might think."*

(Report available at www.montanachamber.net/ws/filelib3php?SubDir=TechEconomy)

Steve Holland, MMEC Director

Time to "Get the Lead Out"

By Mark Shyne
MMEC Field Engineer

New environmental regulations will significantly impact Montana companies that produce electronic products, starting with those that export to Europe.

New laws in the European Union (EU) will force manufacturers to eliminate virtually all lead, mercury, cadmium and other toxic materials from their products (and manufacturing processes) by next year. Similar laws are also in development in Japan, China, the USA, and other places around the world. Many refer to the new laws as "lead-free manufacturing" although lead is only one of the substances being banned from consumer electronics.

New directives from the EU

Directive 2002/95/EC: Restrictions on the use of Hazardous Substances (RoHS)

Directive 2002/96/EC: Waste Electrical and Electronic Equipment (WEEE)

The WEEE directive requires that manufacturers take products back at the end of their useful life, at no cost to the consumer, and have a recycling program to reclaim or reuse as much as possible.

The RoHS directive is **the big one** impacting companies and will be the focus of this article.

RoHS requires that by July 1, 2006 all new products being placed on the EU market will be free of certain hazardous substances:

Lead (Pb)
Mercury (Hg)
Hexavalent Chromium (CrVI)
Polybrominated Biphenyls (PBBs)
Polybrominated Diphenyl Ethers (PBDEs)
Cadmium (Cd)

What is driving this legislation is the endless availability of new "disposable" consumer electronic products, and the amazing ability of product designers and producers to put more functionality into smaller and smaller spaces. It's a sort of paradise for users of technology, but at a price — heavy metals are being poured into our landfills at warp speed.

Mark Shyne

Studies done in King County, Washington (home of Microsoft) show that discarded consumer electronics account for about 4-5% of the total volume of waste entering the landfill but close to 70% of the heavy metal content. The average television contains in the range of 4-6 POUNDS of lead – yes pounds, not ounces or grams. As of last November, California consumers began being charged a $6-to-10 recycling fee when buying products containing mercury, cadmium, and especially lead. It's pretty clear what needs to be done – 'design out' the lead-based materials.

Years ago lead in paint, gasoline, and plumbing solders was banned, so these new laws are a natural extension of that. In short, it's time to "get the lead out" of our environment and work places.

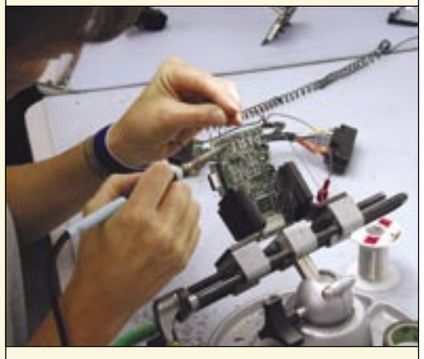
Headaches for electronic product manufacturers:

The impending regulations are already causing major headaches for component manufacturers and their OEM customers, requiring significant system upgrades, duplicate part numbers for lead free parts, duplicate assembly lines for lead free, and even new soldering and rework equipment. It's affecting just about every business process, from product design to supply chain management, production, and even sales and marketing. Electronics manufacturers have little choice but to comply. Failure could mean banishment of their products from major markets and millions of dollars in lost sales. OEM's are already evaluating who their future suppliers will be, and it may not be their current ones.

A look at what companies are doing about RoHS shows several Montana manufacturers are already being asked to lay out their lead free plans, so the customer can react to demands from its customers. It goes up and down the supply chain - to both ends of it. Here are some of the issues:

1. **Part Numbering.** Some component manufacturers are not changing part numbers but may be changing materials. *Watch out!* That part you had no problems with in the past but cannot seem to solder now has changed. Where it had a tin/lead finish in the past, it likely has a pure tin finish now, affecting soldering temperature, flux activation, and other factors.

2. **Flood of Data Requests.** Component manufacturers are being flooded with requests for data from customers about every part on every circuit board for every different product they produce. This will become the "objective evidence" needed to prove compliance with



Changes will impact solder temperature, flux activation & other factors.

RoHS, if asked. The RoHS directive requires that the company provide the data within 28 days of the request.

3. **Alloy Test Results Not Shared.** Many solder alloys are being tested (for high yield production and field reliability), but companies are being tight lipped about the results. It's being viewed as a competitive advantage in the market place.

(continued on page 5)

Public-Private Team-Up Enhances Training

The Montana Manufacturing Center (MMEC) teamed up with the Montana Aerospace Development Association and Neptune Aviation Services in Missoula recently to deliver a three-day AS9100 Internal Quality Auditor Training workshop to aerospace manufacturers from across Montana. Neptune Aviation performs heavy aircraft maintenance, has an engineering/design and fabrication shop, and is involved with fire suppression aircraft. The company is committed to a quality management program and AS9100 certification.

Tracy Brendal (left), Neptune's Shop Manager, shows auditor Phil Leiritz (right) from CM Manufacturing the FAA-approved documentation on structural repair.

The course covered the AS9100 quality standard (and the broader ISO-9001:2000 standard) including what formal registrars look for during registration and surveillance audits at companies certified to the standard. It explored the relationships between the quality policy, a quality manual, procedures, and supporting records, and participants learned how to document nonconformance and corrective action.

A day of live audits at Neptune's facility focused on practice auditing with checklists, evaluation techniques, and related documentation specific to AS9100 that were covered in the workshop. After course completion, 11 students were certified as AS9100 Internal Quality Auditors and will play a vital role in sustaining a documented quality system for their companies.

Workshop participants pose beside a Lockheed P2V Neptune during the live audit practicum at Neptune Aviation's facility.

MMEC engineers served as audit coaches for the course taught by certified instructor Jeff Omelchuck from IQA Associates, Portland, Oregon.

If you are interested in attending a three-day ISO9001:2000 Internal Quality Auditor Training workshop being organized for Bozeman later this year, contact MMEC at 406-994-4507.

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Get the Lead Out (continued from page 3)

4. **Challenge to Process Engineers.** Tin – Silver – Copper (Sn-Ag-Cu or SAC) is emerging as a replacement material. Some companies are adding a little Indium to get the melting temperature down a bit – closer to the temperatures used today with tin/lead systems. This is especially true for wave soldering materials. For surface mounts, it's not clear which materials are emerging as the best replacements. Regardless, they will cost more and have a tighter "process window" driving process engineers crazy as they try to dial in the soldering recipe.

5. **Lots of Rethinking.** Product manufacturers are asking themselves, "Which products will we redesign, and which will be end-of-life?" It will be costly to redesign, but market share is dependent on delivering what customers are demanding. Marketing and Engineering are pondering these questions as they discuss it with top management.

6. **Data Management Challenge.** Many companies are modifying their MRP or ERP systems (integrated accounting and manufacturing software) to address Lead Free. And they are having to greatly expand their part numbers – one for the lead free part; one for the regular one. Same with assemblies, on up to the top assembly.

7. **Circuit board finishes are changing.** The old tin/lead dip is going away and choices are becoming OSP (organic solder preservative), tin dip, silver dip, nickel over gold, and little else.

8. **Training Required.** Workmanship standards for Lead Free are being developed, but do not exist today. The new alloys will result in solder joints that look different, requiring training and really understanding the process and reliability issues. Remember, 'wetting' of the solder to the metal surfaces being soldered is still the number one criteria.

Study Group Shows Its Quality

The following people were recently certified as Quality Managers by the American Society for Quality (ASQ).

Kim Ensign,
Big Sky Laser, Bozeman
Robert Gibson,
Simms Fishing Products, Bozeman
Matt Bentle,
Simms Fishing Products, Bozeman
Eleanor Cooperider,
Student Assistance Foundation, Helena
Kreg Worrest,
MMEC, Missoula
Al Deibert,
MMEC/MilTech, Bozeman

This certification is a mark of excellence awarded for a three-year period to those professionals who pass an extensive standardized exam. The exam measures comprehension of the body of knowledge for quality management. Holders of the certification gain peer recognition for proficiency with understanding quality standards, organizational assessments, and maintaining customer satisfaction and focus.

Preparatory to sitting for the March ASQ Certified Quality Manager exam, the group arranged to get together in a half-day study group each week for ten weeks.

"I can't say enough good about the class! Having structured, scheduled study time was invaluable," said Cooperider from Student Assistance Foundation who sat for the test with eight others. "Without that, it's awfully easy to get 'too busy' or to let interruptions take over. Al and Kreg from MMEC were outstanding with their help in understanding the material, especially Kreg's efforts for the statistics part of the Quality Tools section. I can't say that I'd have succeeded without the class!"

Quality is a conscious decision.
"If every player in an industry is fundamentally incompetent, competition can reduce provider margins, but it won't do much to reduce costs or improve quality for customers."
—Jim Womack, Lean.org

Environmental Management Workshops Planned

Two workshops on developing and implementing an Environmental Management System (EMS) will be offered in June by the Montana Manufacturing Center (MMEC) in partnership with the Montana Department of Environmental Quality (DEQ).

The sessions will be on June 7 at the Billings Hotel & Convention Center and on June 9 in Missoula at the Grant Creek Inn. The training will be conducted by staff from the Kentucky Pollution Prevention Center (KPPC) with assistance from the staff of MMEC and DEQ.

Essentially, an EMS provides the framework for managing environmental responsibilities, including regulatory compliance. By using a system-based approach to improving overall environmental performance and placing more emphasis on pollution prevention, an EMS can also help an organization move beyond compliance to improve their competitiveness. For example, an EMS is a practical tool for achieving initiatives such as environmentally preferable purchasing, energy efficiency, design-for-the-environment, and sustainability.

An EMS can also be designed to meet the requirements of the ISO 14001 – a environmental standards certification. Montana is beginning to see interest in this standard.

Participants will learn more about planning for sustainability, the assessment process and details associated with implementation that can use your organization's existing environmental system. Registration fee is $30 and includes lunch. Online registration will be available at *www.mtmanufacturingcenter.com*. A future mailing will be sent with more training specifics. Please contact Bonnie Rouse (DEQ) with any questions you may have, *brouse@mt.gov* or 1-800-433-8773.

Innovation Sprouts from Soils Research (continued from cover)

system has been devised to allow easy insertion and retrieval of capsules. This system is manufactured by WECSA at St. Ignatius in western Montana.

Skogley and fellow researchers have spent years putting the resin capsules through the rigors of laboratory and field testing before more recent test marketing and mechanization phases. Skogley has built resources and partners to move the project forward including partners at UIC (UNIBEST International Corporation - *www.unibestinc.com*) in the Tri-Cities of the Columbia Basin in Washington where many high-value crops are intensively managed under irrigation.

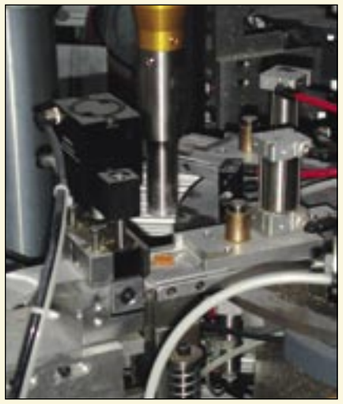
Market Potential

Market feasibility and large scale testing have been underway at UIC. The capsules are being used in high intensity agriculture for potatoes, sweet corn, alfalfa and other crops in Washington. They have been studied for several years for use in rice paddys by the International Rice Research Institute in the Philippines with excellent results, according to Skogley. Pretty exciting news for soil scientists who have long known the research methods they used were not ideal for improving soils and harvests.

Even more exciting is that field tests and marketing research have shown that different resins can be used to give the capsule great potential for use in hazardous waste and environmental reclamation efforts for both soils and water. Organic or inorganic materials can be collected, depending on the resin type.

UNIBEST's ENV resin capsules are used to study environmental contamination. They attract organic substances in soil from both liquid and vapor states to detect, monitor and quantify substances from pesticides, hydrocarbons and a wide range of other organic chemicals, according to the company website *(www.unibest.us)*. Skogley said there are between 300-400 resin types for scientific uses and practical applications.

The technology has potential to monitor leakage from landfills or buried fuel tanks and for sourcing of pollutants that enter bodies of water, he said. Traditionally, in well testing, as much as 150 gallons of water would be pumped prior to sample collection for analysis; and in contamination situations, scientists would have to dispose of all of it using EPA protocol. The same is true at sites like the Hanford Nuclear Facility where radioactive wastes are an issue. Using resin capsules would greatly reduce the material to be handled and the cost of disposal.



An ultrasonic welder seals beads into the first half-sphere before the two halves are joined.

The U.S. Forest Service, universities, and other federal and state agencies are using capsules for numerous studies, and the technology is available for use by home owners for lawn and garden improvement. About one-fourth of the customers are from foreign countries.

Automating the Process

Such positive indicators turned Skogley's attention to automating the 10-step capsule assembly process to increase output several years ago. Having been an MSU researcher himself, he first enlisted the help of MSU engineering students in a Senior Design Project to explore the feasibility of mechanizing the steps. Student research provided him with cost comparisons and pointed to definite savings in both time and labor.

Next, Skogley sought assistance from Mark Shyne and Dale Detrick at the Montana Manufacturing Extension Center (MMEC) for preliminary design to automate the process of filling both sides of the capsule with resin and joining them together without losing the beads. MMEC also prepared a list of potential design and tool-making firms for his consideration.

"Mark helped me put together an agricultural marketing proposal for funding a low interest loan," Skogley said. "He wrote a letter of support that I'm sure helped us land the money — $50,000 that was not a grant but a low-interest loan." The proposal included cost estimates for the design and fabrication, a vital piece of data required by the loan agency.

UNIBEST selected Jungst Scientific of Bozeman for the final design and manufacturing of the machine that is now in operation. Skogley said it is fairly complicated in order to perform all 10 steps and balance delicate temperature/time relationships. Two strips of plastic-mesh film are fed into two separate rotating tables of the machine and sliced into squares. In heated forms these squares of film are molded into half-spheres. The half-spheres are filled with resin and a cover film is welded onto one of them. This one is turned over and welded onto the other half-sphere to make a complete sphere. The welding is done using two ultrasonic welders that create enough heat at the point of contact to weld the plastic materials together. Excess film is trimmed in a press and the waste material blown by a puff of air into a receptacle. All of these processes occur automatically and simultaneously.

Output Increases 30-fold

Until this year, the capsules were made manually, taking 30 hours to make 300 capsules; the new machine cranks out 300 in an hour, he said. The PST-1 capsules for soil testing currently make up about 95 percent of UNIBEST manufacturing demand, but within a year Skogley predicts that will change, as he is working to obtain EPA approval of the technology for use in environmental monitoring.

Providing a demonstration of his first machine's capability, he remarked, "I'm not sure I could have reached this point

(continued)

Innovation (continued from previous page)

without the prototype design work, support, and advisory capacity of MMEC. The Center helped me with contract and detail management while the machine was in development and made sure I was happy with the product — that it was meeting my needs."

Skogley envisions a day when 10 machines will be operating. Working with people locally and having them available when needed was a big advantage in launching the automation project, he said, commending the efforts of MMEC engineers and Tom Jungst and Matt McCune at Jungst Scientific.

UTAP Successfully Re-Competes; Adds New Service

The University Technical Assistance Program (UTAP) in the Montana State University College of Engineering is one of only six university center programs in the 10-state Denver region to successfully compete for a three-year grant from the U.S Economic Development Administration this fiscal year. A new marketing systems service was added to the engineering and managerial assistance that has been offered by UTAP since 1986. Under the direction of Steve Holland at the Montana Manufacturing Center, UTAP is an excellent example of the partnership of higher education with key leaders in business, government, and civic groups to move Montana's economy forward.

MMEC/UTAP partnered with the Montana World Trade Center in the School of Business Administration at the University of Montana to provide the specialized marketing service. Graduate students earning advanced degrees work directly with companies under supervision from professionals Mark Shyne and Fraser McLeay at the respective campus outreach centers. The MSU graduate students are Shane Cantrell, Seth Partain, and Brian Pendergast who have been with the program since 2003. The recently hired UM grad student is Jesse Lohse.

Manufacturing News

MSE-Tetragenics Awarded River Projects

In January, **MSE-Tetragenics**, *www.tetragenics.com*, an automation, control, and monitoring company located in Butte, Mont., announced the award of three projects for controlling water levels on the Genesee River in Rochester, NY. These SCADA (supervisory control and data acquisition for gathering and analyzing real-time data) projects will provide water flow and level control capability at dams on the Genesee River in the City of Rochester, NY. The work is underway and is scheduled for completion by summer 2005. MSE has been doing work in this area since 1990. MSE-Tetragenics is a division of MSE Technology Applications, Inc., one of the nation's premier advanced technology development firms.

WOOD 100 Recognition

Dovetail Designs & Millwork Inc., a Billings firm, was ranked as one of the fastest growing companies in the woodworking industry in the latest WOOD 100, an annual survey conducted by **Wood & Wood Products** magazine. Dovetail, a residential and commercial custom cabinetry shop, ranked 35th in the survey. Company President Mark Sevier attributes the addition of a CNC router to revving up profit margins by 33 percent in 2003, according to the WWP webpage, citing far fewer hours in cutting and machining cabinet parts since modernizing. The company has 16 employees and has been operating since 1979. For more information visit *www.iswonline.com/wwp/200409/wood100intro.cfm*

Scam Alerts

The Web site for the Montana Department of Commerce **Overseas Offices Trade Program** (OOTP) includes information on email scams that target small businesses and manufacturers. Click on the International Business tab at *www.exportmontana.com* and go to Suspected Scams. Do some checking before you act on an overseas solicitation, especially one not related to a targeted marketing effort by you. If you have questions, check the Web site or call the OOTP at (406) 841-2754 or the Better Business Bureau at (800) 248-2356.

Deadline May 6 for VAPG funds

The **Department of Agriculture Rural Business - Cooperative Service** (RBS) announces the availability of approximately $14.3 million in competitive grant funds for fiscal year 2005 to help independent agricultural producers enter into value-added activities. Funds would be for (1) Planning activities needed to establish a viable value-added marketing opportunity for an agricultural product (e.g. conduct a feasibility study, develop a business plan, develop a marketing plan); or (2) acquire working capital to operate a value-added business venture that will allow producers to better compete in domestic and international markets. USDA-Rural Development is offering outreach to potential applicants and one-on-one counseling to assist in application preparation. Deadline for submission is 4 p.m. Eastern time on May 6, 2005. VAPG application guides and materials are available at *www.rurdev.usda.gov/rbs/coops/vadg.htm* or by contacting Bill Barr, USDA-Rural Development, at (406) 585-2545.

Summer Trade Mission Planned

The Montana World Trade Center in cooperation with Congressman Denny Rehberg's Office is putting together a Trade Mission for this summer. The trip is tentatively set for July 2-9, and countries to be visited are Ireland, Germany, Brussels, and Spain.

The trade mission is a real opportunity for companies to meet one on one with potential trade partners, pre-screened buyers, and suppliers and to discuss concerns with overseas trade, according to Fraser McLeay, senior manager at MWTC. The venture is in partnership with the U.S. Commercial Trade Service. The closing date to participate is April 29, 2005.

For more information, contact Megan Harrington at MWTC, 406-243-6982, or by email megan@mwtc.org.

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Mark Your Calendar: Spring 2005 Workshops

April 19	Lean Manufacturing Workshop/Simulation, 1 day	Holiday Inn Grand MT - Billings
April 20	Lean Manufacturing Workshop/Simulation, 1 day	Holiday Inn Grand MT - Billings
May 10	Lean Manufacturing Workshop/Simulation, 1 day	West Coast Center at the Mall - Kalispell; with enough interest, course will be offered again May 11. Contact MMEC.
June 7	Environmental Management System Training , 1 day	Billings Hotel/Convention Center with Kentucky Pollution Prevention Center hosted by MMEC & MT DEQ
June 9	Environmental Management System Training, 1 day	Grant Creek Inn - Missoula with Kentucky Pollution Prevention Center hosted by MMEC & MT DEQ

For more information, course fees or to register on-line go to www.mtmanufacturingcenter.com or call MMEC at 406-994-3812.

2005 Other Dates To Remember

April 27	Forklift Instructor Course, 9-noon, Montana Safety Council, Billings
April 28-29	2005 MEDA (Montana Economic Developers) Spring Conference, Cottonwood Inn - Glasgow.
May 18	Government Accounting for SBIR Companies, 9 am - 4 pm - Helena

ForwardFocus is a Newsletter for Montana Manufacturers
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CHECK IT OUT! Now with a **NEW LOOK!**

Feel free to contact MMEC about manufacturing topics or issues that concern you and send your company news briefs to dnash@coe.montana.edu

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Great Falls, MT 59403

a NIST MEP | Network Affiliate