NLI Takes Quality to the Next Level with Lean Six Sigma

By Deborah Nash, MMEC

Lean Six Sigma is boosting the results of quality initiatives at Nutritional Laboratories International, Inc. (NLI). The enhancement is part of ongoing improvement to the Total Quality Management system NLI uses to differentiate itself in the health and wellness industry.

Commenting on the strategy, Chief Operations Officer and Six Sigma Green Belt Brad Nylander said he and Continuous Improvement Manager Andy Roche recognized the need for good problem solving tools to ensure measurable outcomes for several targeted projects. Lean Six Sigma is helping them achieve that.

NLI offers premier manufacturing and laboratories services (www.nutritionallabs.com) and is based in Missoula. It has been in operation since 1997, employing up to 108 workers. The company’s core processing capabilities include encapsulation, tabletting, tablet coating, and bottle packaging/labeling for a number of major U.S. supplements marketers. These are subsequently distributed all over the world. The company operates within the pharmaceuticals and dietary supplement industries and adheres to FDA Pharmaceutical Standards of current Good Manufacturing Practices (cGMPs). The company recently earned formal GMP registration through NSF International’s Dietary Supplement Certification program (www.nsf.org).

Rooted in the Quality body of knowledge, Six Sigma is a process designed to make decisions more systematically based on data. The term hails from the Motorola® drive for defect reduction in the 1980s. Lean Manufacturing targets elimination of non-value-added activities. Together, they are very powerful.

Training Is Key

NLI recognized that investment in training is key to achieving substantial benefit in both Lean and Six Sigma, and Roche set out to identify appropriate tools and training to advance several quality initiatives. He engaged Kreg Worrest, Field Engineer from the Montana Manufacturing Extension Center, for a very hands-on approach. Eleven employees from two teams participated in Lean Six Sigma training over a period of weeks from December 2005 through April 2006.

“What made this unique is we had Kreg in for three hours once a week over several months to train on specific tools as the teams worked real projects,” Nylander said. The training schedule was adjusted to one hour a week as teams progressed toward their end goal. “MMEC was really flexible based on the progress of the team; it was very effective.”

Cross-functional team members brought a wealth of experience in how operations currently worked. The training provided tools that would deploy Lean, help capture current situation data, and develop problem solving techniques for data analysis and trend identification. The goal was to implement changes and measure effectiveness.

What made it particularly effective, according to Worrest, was
1) Management being highly supportive because they had real problems to solve;
2) Management holding teams accountable to the process and to achieving results;
3) Teams having significant, real projects to focus on;
4) Teams immediately applying techniques from the class on their projects, and
5) Andy Roche.

“Andy understands Six Sigma methods, and he was able to monitor team progress and provide feedback. He could tell me what worked and what needed more explanation,” Worrest said. He could then tailor each subsequent training session to what the groups needed. “Where they had success, I could reinforce the techniques. Where they had difficulty, I could review the technique again or suggest a different method. That internal feedback helped me modify our original plan to match what each team needed for success.”

Value in Linkage

Unlike boiler-plate training that uses (continued on page 4)
Think Globally – Act Locally – Innovate Together

Encouraging signs about global market expansion as a real growth opportunity here in Montana are in the news. Manufacturing has flipped the historic Montana trend of exporting more agricultural commodities (60%) than value-added goods (40%). The blend is now 40:60. With 96 percent of the world’s consumers living outside the U.S., we need to keep this trend growing since value-added products return more dollars to the state.

I moderated an export panel during the recent Economic Development Summit in Butte and can tell you Montana is hard at work positioning itself to broaden both international relationships and connectivity that can bolster this trend.

In the words of Summit host Senator Max Baucus, “Montana must exploit its international connections, think forward and grow outward. It’s the excitement, the attitude of working Montanans that will be a big part of their success.” The Senator called for a plan to get wireless Internet connectivity out to all communities to enable fast, far-reaching communications necessary for a more global economy.

Demystifying the export process is another critical step, especially for initial entry into export markets. The Montana World Trade Center, along with several partners, has stepped up to the plate to offer a Global Trade Certificate Program this fall (see page 8) where participants will attend workshops with the option of becoming certified through the process. The goal is to build up the network of informed professionals in both manufacturing and support fields, such as banking, law and finance, in global market expansion efforts. Having more players who are well informed is a win-win for Montana.

Process improvements and efficiencies are a crucial foundation. MMEC has been assisting you in this regard with cost savings, improved capacity and enhanced capability. While we continue to provide strong technical and engineering solutions (equipment justifications, plant layout, design for manufacture, etc.), we deliver many higher value solutions like Lean Manufacturing and financial modeling. Today we include strategic management and coaching for clients. But where are we going?

It’s the question you must also ask yourself. “Where am I going; where do I want my company to be in five, ten years?” What is the next step?

In today’s global economy, accelerating concept development and igniting innovation strategies across product development, sales and production is essential. To stay competitive, you must continue process improvements, develop new and better products and identify and deliver to new markets. If you have done the first two but not the third, you have left most of your potential on the table. Innovation today is really about top line growth — new products, product extensions, new markets (possibly international), and new messages dovetailed with process improvements to help realize greater sales and profits.

(continued on page 6)
Trade Mission...

Expand Your Market to South America

The Montana World Trade Center (www.mwtc.org) is seeking interested businesses to join its August trade mission to South America with feedback on which countries are preferred: Brazil, Argentina or Chile. Two of the three countries will be selected.

The trip is planned for early August. South America was targeted for the next MWTC trade mission based on feedback from member companies. Leading sectors for US exports in each country, according to the US Commercial Services, are agricultural equipment, agriculture, aircraft and parts, medical equipment and pollution equipment for Brazil; agricultural machinery/equipment/parts, residential building materials/supplies, mining machinery/equipment, and medical equipment/supplies for Argentina; and mining equipment, healthcare/medical equipment, pollution control/water treatment/environmental services, financial services and franchising for Chile.

“The trade mission offers an excellent opportunity to explore export potential,” according to Megan Harrington, project manager for MWTC and recent winner of the Governor’s Export Advocate of the Year award. “It is also an ideal trip for companies that import from these locations or have interest in exploring this option more seriously.”

Anyone with serious interest should contact Megan at 406-243-5850 or email to megan@mwtc.org.

Biodiesel: Issues & Opportunities

While it is easy to make a small batch of biodiesel, real challenges exist to produce volume and meet ASTM spec fuels standards while still being profitable. Jim Haider (pictured left), MMEC field engineer for the 32-county WIRED bio-products region, recently presented a Primer on Biodiesel Manufacturing with a live laboratory demonstration, co-sponsored by the Great Northern Development Corporation in Wolf Point. The event was attended by a dozen interested people. The workshop explored what biodiesel is, how it can be manufactured, issues, risks, feedstocks, markets, costs, feasibility, safety and regulations. Additional workshops are planned. For information, email jhaider@coe.montana.edu.

SBIR Outreach Changing its Name

The Montana SBIR Outreach Program is broadening its scope and changing its name to the Montana Technology Innovation Partnership (MTIP).

According to Linda Brander, Program Manager, “The state’s support of small technology firms has been expanded to all sectors of Montana’s burgeoning technology-business community, regardless of their involvement with SBIR and STTR.”

The Montana Department of Commerce initiative has been created to promote technology commercialization as a viable economic development strategy for the State of Montana. Its mission is to help build the short-term benefits of technology research and development into the long-term rewards of economic development.

The program builds on six years of success as SBIR Outreach Program, supporting Montana applicants to the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer programs (STTR).

MTIP’s services (www.mtip.mt.gov) are provided at no cost and will include guidance in the following areas: pursuing SBIR and STTR grants, identifying and assessing other potential funding opportunities, coaching in proposal development and submission and in the understanding the complex issues involving intellectual property. Companies can also get assistance with detailed commercialization planning, including an understanding of the market research needed. MTIP is also a resource for identifying and assessing sources of technologies available for licensing.
NLI Takes Quality to the Next Level (continued from cover)

broad examples in order to relate to all participants, the MMEC engineer’s sessions used specific company examples and “spoke the company’s language.” The value of training was greatly enhanced by linking the tools learned to the problems being solved.

Some of the “homework” assigned to team members between classes was to develop a project charter; construct a process flowchart that was very important for a cross-function team working together; create a SIPOC process diagram (supplier, input, process, output, customer); and measure current process performance as a yardstick for future improvements.

For accountability and to keep moving forward, the COO required each team to meet with him every other week for a progress check. review and defense of findings and conclusions. He also asked for updates on what the teams planned next.

The meetings provided a focused time to review difficulties and ensure the next steps were appropriate based on Six Sigma, Worrest explained. “Andy followed up by making sure the teams developed methods to verify that the changes were effective and had long-term controls to sustain the gains.”

Applied learning within a real manufacturing environment brought throughput gains from Team A, a valuable cultural change for the organization overall and exploration of a strong business strategy now under management review from Team B.

Team A and Visual Controls

Roche’s facilitation of Team A aimed at gaining throughput efficiencies. The standard Define-Measure-Analyze-Improve-Control (DMAIC) method was used.

The team goal was to reduce reworked WIP (work in process) by 50 percent, as measured by Rejected Material Reports (RMR). RMRs are generated when anyone in NLI finds nonconforming raw materials, WIP, or finished product.

During the project, the team flowcharted and reviewed the entire production process and identified many small improvements. The visual standard chart now being used for operational excellence shows correct product and defect type. Its purpose is to provide a common frame of reference for operators to recognize and refer to defects in the same way. But it goes beyond defect recognition and is also used as a diagnostic tool.

It helps identify where a problem is occurring and the root cause. Roche explained. Lean Six Sigma shifted responsibility for quality to the operators. Previously, maintaining product quality depended on defect detection at the next operation. Additional training brought each operator up to same level of problem identification and machine operation. NLI uses statistical process control software on computers throughout the production floor along with control charts to help operators reduce variation in each production run.

“Using FMEA (failure mode and effects analysis), we learned to scope out the problem and understand the process. The key, we found, is the operators who can realize when a defect happens and take corrective action.” They also learned when a defect is outside their control and can seek help. Metrics were installed that helped eliminate the effect of operators as a cause in process variation as well.

“The training created continuity and a consistent way of evaluating processes,” Roche said. The improvements resulted in identifying potential areas where out-of-specification material (RMRs) could be prevented or the process halted, resulting in only a small amount of material to reject. Production now identifies any out-of-specification processes in production much faster than before.

Cultural Shift

Nylander has noticed the change at NLI prompted by identifying the greatest control point right on the shop floor—the operators. That really gave “ownership” of the improvement process to production workers, he said.

“Recognizing the value of data, they are now pareto-ing even in the warehouse; from kitting to the shop floor, they are charting reasons for delays and analyzing why they are occurring,” he said. “It’s helping see causes we can control and causes we can’t; it really developed through MMEC and Andy, implementing a continuous improvement culture for us.”

“People at NLI are no longer interested in just maintaining the status quo.”

The rework [elimination] project required no capital except training and time for both data gathering and applying lessons learned on the floor.

The COO reported that six months after completing training, Team A has already had good success. “We have had a 25 percent reduction in rework and anticipate another 25 percent for 2007.

“I am very pleased with the training; the take away that the team had. They now look at problems with more data-driven observations,” he said. “It has changed the culture of our organization.”

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MMEC Director, Field Engineer Receive Honors

MMEC Director Steve Holland has earned a Montana State University Provost’s Excellence in Outreach Award from MSU. The honor is one of several achievement awards presented to top faculty and staff during the Honors Banquet in May. The criteria for the award were visibility, impact/significance and quality of outreach.

“It is significant that, when [university] President Geoff Gamble is seeking MSU outreach success stories, he often turns first to the MMEC,” said Tech-Link Director Will Swearingen in the nomination letter for Holland.

“Through Steve’s leadership and strategic planning skills, the MMEC has become a truly high performance outreach organization. It is not only one of Montana’s most respected outreach organizations but also one of the most successful Manufacturing Extension Partnership (MEP) centers in the United States.”

“It is quite an honor – but our accomplishments are really due to the men and women that I work with here at the Center who do good work every day and who are passionate about our mission,” Holland noted. “I appreciate the trust Montana companies have placed in us over the years. It is their success that we share.”

Steve’s leadership role in several state and national manufacturing-related boards and MMEC performance measures that are derived from an independent client survey through the NIST Manufacturing Extension Partnership were important in building the nomination.

MMEC Field Engineer Kreg Worrest earned an MEP Practitioner of the Year Award at the recent National MEP Conference in Orlando for his strong commitment to the Manufacturing Extension Partnership national knowledge base and clients as well as professional Quality organizations.

He was honored for trailblazing in the Quality arena, generating impacts for clients and teaching other practitioners. His innovative approaches to mapping the quality stream and workforce training using skit-style learning were recognized as significant contributions to the broader body of knowledge. Worrest serves from the Missoula field office located at the University of Montana.

Kreg Worrest honored for trailblazing in the Quality arena, generating impacts for clients and teaching other practitioners.

MMEC Director Steve Holland (right) shakes hands with Kreg Worrest (left) as NAM President, former Governor John Engler, looks on at MEP Conference in Orlando.

NAM President Praises MEP Contributions

The April 24, 2007 edition of the Reliable Plant Magazine included an article with a quote from National Association of Manufacturers (NAM) president John Engler praising the contribution of the Hollings Manufacturing Extension Partnership (MEP) system to the U.S. economy. Engler stated that NAM “strongly supports adequate funding for the MEP.” The former governor called for more funding for MEP network.

“In fiscal year 2005, you can credit the MEP with helping to create or save more than 53,000 jobs and generating more than $6 billion in sales,” Engler, as a keynote speaker, also told attendees to the 2007 MEP National Conference in Orlando, Florida. “By some accounts, the MEP stimulated more than $2.2 billion in economic growth – contributing to an innovative, investment-rich manufacturing sector.”

The Montana Manufacturing Extension Center is one of 59 MEP centers across the U.S. and in Puerto Rico. MEP provides access to a range of resources and services meeting the critical and often unique needs of America’s manufacturers. The system leverages just over $100 million dollars of federal investment into a nearly $300 million dollar program by teaming with industry as well as state and local organizations.
**Manufacturing News**

**Sonju Industrial Inc.**, Kalispell, a manufacturer of precision CNC machining and light assembly of components for the aerospace industry, recently earned an ISO 9001:2000 and AS9100:2004 Quality Management System (QMS) certificate. The certification was announced by SRI Quality System Registrar, an internationally accredited registrar.

**Plywood Plant Closure**

**Stimson Lumber Co.** has announced it will permanently close its plywood plant in Bonner on July 7, according to the Missoulian. The closure is attributed to chronic, long-term log shortages in western Montana for area milling capacity. The plywood plant currently employs about 140 people. Stimson will continue stud mill operations at the site, employing over 100 workers.

**Award for Top Sales**

**Roscoe Steel and Culvert Co.** was recently awarded Regional Distributor of the Year recognition for the Northwest region. It was honored for top sales in the BioNet series of product offered by North American Green. Roscoe is a manufacturer of corrugated steel pipe, bridges and fabricated steel structures with locations in Billings, Missoula and Casper, Wyo.

**Trebro Manufacturing Grows Exports, Honored**

Turf harvester maker **Trebro Manufacturing, Inc.** of Billings is this year’s Montana Small Business Exporter of the Year. The company was founded in 1999. It is the world’s largest manufacturer of sod harvesting equipment. Its exports have grown to more than $10 million since 2002 when it had zero exports, according a Montana Small Business Administration (SBA) publication.

**Teamwork Recognition**

Four senior managers from **LigoCyte Pharmaceuticals, Inc.** of Bozeman were named by Montana SBA as Small Business Persons of the Year: Robert Bargatze, Donald Beeman, Robert Goodwin, Charles Richardson. The nine-year-old company focuses on cutting edge research and development and builds alliances and partnerships to move products into the marketplace.

**Dillon Firm to Triple Capacity**

**Nutracea** is expanding its Dillon plant by 50 percent. Strong market interest in the company’s proprietary stabilized rice bran derivatives prompted the move to triple production capacity annually. Project completion is expected by summer 2007.

**Strong Showing**

More than 100 Montana-based exhibitors showed their products to 375 retail buyers and more than 2,500 individual shoppers at the **Made in Montana Marketplace** held in Great Falls March 2-3.

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**APICS Forming First MT Chapter**

APICS, the Association for Operations Management, is forming a new chapter in the Billings area, the first chapter in the state of Montana. APICS is an organization of business professionals involved in all areas of Operations Management. Dinner meetings will be held on a regular basis with guest speakers to further member knowledge and skills. Plant tours will also be offered.

Through APICS, members can obtain several professional certifications, the most common being CPIM (Certified in Production and Inventory Management). Individuals can study on their own or attend classes sponsored by the chapter.

Interested in becoming a member of the new APICS chapter? Contact Jeff Wilkes, CPIM, Director of Procurement and Planning at Group Montana, Inc. in Columbus. Phone 406-322-6042 or email jwilkes@montanasilversmiths.com.

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**Think Globally** (continued from page 2)

Again, the important questions emerge: Where to next?

Be watching for more global trade expertise and expanded technology innovation initiatives across the state. Stay tuned for an opportunity to participate with MMEC in a Manufacturing Excellence Tour that will visit state-of-the-art facilities in Michigan this fall to benchmark the best. Look for the MMEC roll-out of new services that promise to ignite your top line growth. And be sure to mark your calendar for an important and inspiring message from Doug Hall, owner of Eureka! Ranch, during our 2008 Compete Smart Manufacturing Conference in Missoula.

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*Steve Holland, MMEC Director*
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Eliminates Hidden Factory

The project put an end to product rework that Nylander calls “the hidden factory” that swallows up resources and simultaneously impairs productivity.

For example, if 50 Kg of tablets out of a 2,000 Kg order don’t meet hardness specifications and have to be reground and go back to the tablet press, then time, labor, and cost are added to the product which weren’t included in estimated manufacturing production costs. That takes a bite out of expected profits.

By reducing such rework, Team A created cost savings, improved customer response time and freed up operator and machine time to respond to additional sales. Management estimates that a 25% reduction in rework will yield up to $100,000 in labor savings per year as well as freeing up capacity to generate significant revenue. Estimates at the company’s standard margins are expected to exceed $4 million annually.

Using disciplines like Six Sigma for continuous improvement, companies achieve measurable excellence not only internally but also for processes involving customers, partners and suppliers, according to Roche.

“An important next step is to institutionalize and expand on our successes,” he said.

NLI is now filling the pipeline with goals for 2007, assigning four additional teams to apply continuous improvement methodologies to the sales process, manufacturing excellence, and other top-line growth areas.

“We would not be doing that if we hadn’t gone down this path,” Nylander noted.

Prospera Business Network Announces $200,000 Job Training Grant for CDI-Aerospace

Prospera Business Network (formerly Gallatin Development Corporation) recently announced the award of a $200,000 job training grant to support CDI-Aerospace’s (www.cdicorp.com/aerospace/aerospace.html) start-up of its Bozeman engineering design center. The design center employs engineers that perform targeted airframe and subsystem detail design for Sikorsky Aircraft. CDI projects that they will hire and train over 40 employees during start-up.

“We have been successful in our goal of partnering with Montana State University in the recruitment of local engineering graduates who are seeking work in the aerospace industry,” said CDI Manager Dan Rister.

Funding for the project comes from the Big Sky Economic Development Trust Fund Program which is managed by the Montana Department of Commerce.

“This project is a great example of collaboration between the City of Bozeman, Montana Department of Commerce and Prospera Business Network (www.ProsperaBusinessNetwork.com) in supporting CDI in this exciting business venture,” said Prospera CEO Bob Hietala. “CDI is a terrific asset for our local economy.”
Think Global Business Does Not Affect Your Business?

THINK AGAIN!

New offering :: Learn more at www.mwtc.org :: Global Trade Certificate Program

How can you acquire the knowledge and skills you need to prepare your business/institution to leverage the global marketplace?

The Montana World Trade Center, the Governor’s Office of Economic Development and Small Business Administration are pleased to introduce a Global Trade Certificate Program:

• Position your business for success in expanded markets.
• Take a step toward competitive advantage.
• Become charter member of professional support system for Montana companies and be listed in the directory of certified professionals.

WHAT YOU WILL LEARN

• Tangible benefits of going global
• Assessing market potential
• Plan/implement entry strategies
• Pricing products and services
• Evaluating/leveraging agents, distributors & representatives
• Global logistics and distribution
• International negotiation; critical cultural differences— And Much More!

A global trade professional certificate will be provided to participants successfully completing all sessions; 40 Hours Continuing Education Credit available

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** Session 1: September 13th & 14th - Bozeman, Montana
** Session 2: October 18th & 19th - Missoula, Montana**
** Session 3: November 8th & 9th - Butte, Montana

Please visit www.mwtc.org or call (406)243-6982 for details.

** Date & location is tentative, any change will be listed on www.mwtc.org.

“Project funded by a grant from U.S Small Business Administration (SBA). SBA’s funding should not be construed as an endorsement of any products, opinions or services. All SBA – Funded projects are extended to the public on a non discriminatory basis.”

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