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CENTER FOR INDUSTRIAL RESEARCH AND SERVICE
Partnering with the Iowa Manufacturing Extension Partnership

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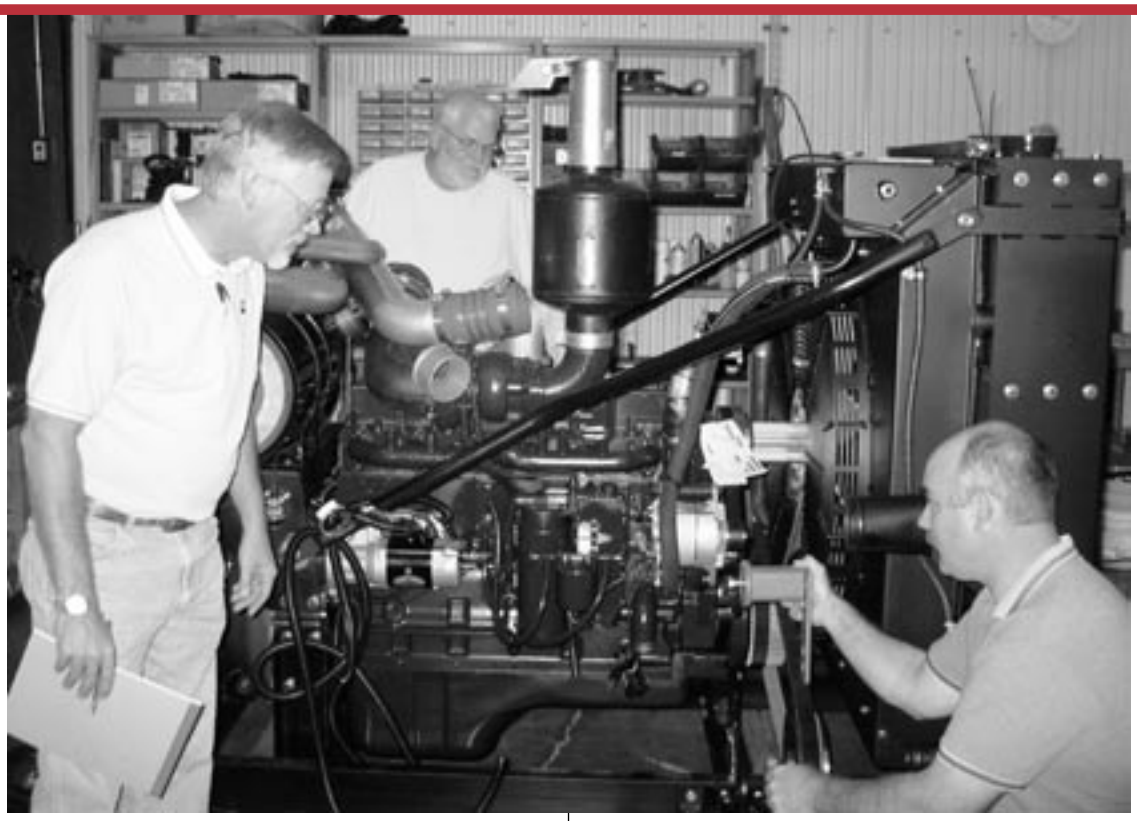
CIRAS NEWS

INSIDE



From left: Dale Koenig, Mark Berg, and Sam Failla work on a Cummins engine.

Company benefits from reorganized work flow

By Gregory Zink, CIRAS

Huge steel storage racks stretch to the ceiling, each filled with as many Cummins engines as it can hold. Below, workers move around enormous industrial power units, adding pieces and making adjustments. In the welding area, sparks fly as parts are fabricated or modified for engines that are waiting for upfit. No square inch in the entire building seems to be unused.

That was exactly the problem facing Cummins Great Plains of Des Moines. Cummins Great Plains designs, manufactures, and distributes industrial power systems, engines, and related technologies throughout the Midwest. The Des Moines plant specializes in upfitting Cummins engines with components such as exhaust systems, hydraulic drives, and intake systems.

"The process is very fast," says Branch Manager Steve Carnine, referring to plant operations. "Engines and materials come in, are put together, and are sent to storage or shipped out rapidly. This cuts down on our inventory and work in process." At the other end, he explains, "suppliers want us to buy large quantities, which means we are caught in the middle."

The busy nature of the plant became even more apparent when the company's corporate office announced the consolidation with another Cummins distributor in Missouri. As a result, Cummins Great Plains of Des Moines needed to prepare to process additional custom engine

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CIRAS Mission Statement

The mission of CIRAS is to enhance the performance of Iowa industry through education and technology-based services.

CIRAS

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A tale of two companies

By Mike Willett and Tim Sullivan, CIRAS, and Sunanda Vittal, Engineering Communications and Marketing

"It was the best of times, it was the worst of times..." So begins ***A Tale of Two Cities*** by Charles Dickens, and so begins this story of a small machine shop. It was the best of times in the sense that the company was receiving an increase in orders, and it was the worst of times because the owners were fighting off bankruptcy and didn't have enough cash to address their problems in easier (though not necessarily better) ways.

Centerville Machining found itself caught between an increased demand for products and a limited cash flow that could not support significant increases in operational costs. Based on recommendations from E-Myth Iowa, a business development unit that Centerville Machining was consulting with at the time, the company contacted CIRAS. CIRAS Industrial Specialists Mike Willett and Tim Sullivan were able to offer an operations management solution.

Willett and Sullivan of CIRAS helped Centerville Machining President David Belloma and his staff assess existing operations. The key finding was that the company's ability to fill orders faster was being limited by the rate at which work was getting through its CNC lathe manufacturing area. The lathes were literally constraining the company's capacity to generate cash; accordingly, the team identified this group of three machines as the "capacity constraint resource" or CCR.

Initial estimate of potential improvement

The assessment included a basic analysis of the financial situation faced by Centerville Machining. The following illustration does not convey real numbers, but it is representative of the company's actual findings:

Total Revenues	$ 800,000	100%
Material Costs	$ 280,000	35%
All Operating Expenses	$ 520,000	65%
Net Profit Before Taxes	0.00	0%

Since the lathes were the company's true capacity constraint resource, the rate at which the lathes were able to complete jobs was the rate at which the company was able to generate cash. To estimate how much cash the company could generate, the team needed to know how much time was available for the lathes to work. The company had two weekday shifts and one shift on Saturday. That meant that the three lathes were "open for business" 88 hours each, for a weekly total of 264 hours.

Dividing the total operating expenses for the previous 12 months of $520,000 by the lathes' availability of 264 hours per week for 50 weeks showed that each lathe needed to average 39.39 "contribution dollars" per hour just to break even.

The next question was crucial since little cash was available: Was it realistic to expect a significant increase in throughput without increasing operating expenses? The answer to that question lay in measuring the CCR's current rate of utilization. It turned out that lathe operators were frequently away from the machines performing other important but unrelated tasks, such as running a mill or helping unload a truck. Here were the findings:

Lathe Utilization: Average Week	62%
Lathe Utilization: Best Week	81%

From this, the CIRAS team calculated that if productive utilization of the lathes could be increased from the average level to that of the best week (and management agreed that 81% was not an unrealistic goal) without simultaneously increasing expenses, a very acceptable profit could be generated! Increasing the output of the CCR from 62% to 81% would produce a 30% increase in output, impacting the financial statement as follows.

Total Revenues	$ 1,040,000	100%
Material Costs	$ 364,000	35%
All Operating Expenses	$ 520,000	50%
Net Profit Before Taxes	$ 156,000	15%

Based on these numbers, Centerville Machining decided to fully pursue the changes.

Assistance

After the lathes were identified as the CCR, the company received training and assistance in establishing company policies, measures, and behaviors to optimize performance.

A small machine shop located in southern Iowa turned to CIRAS for help with managing its operations to improve productivity and cash flow. Pictured, from left, are Mike Willett, CIRAS industrial specialist; Ira Hartley; and David Belloma.

Willett and Belloma take a closer look at one of three lathes that were later identified as "capacity constraint resource." In other words, the lathes were literally constraining the company's ability to generate cash.

Emphasis was placed on

- getting maximum output from the CCR—in this case the CNC lathe area—by changing lathe scheduling and material ordering procedures and decreasing machine downtime and set-up times
- managing non-capacity constrained resources such as the saw, mills, finishing, and quality assurance in a manner that was subordinate to the CCR
- managing cash flow, as well as comparing customers and jobs to identify those that produced cash at a faster rate

Several changes were implemented to manage the CCR for maximum output. Lathe operators were instructed not to leave their machines to help unload trucks. Instead, workers at non-CCR resources were requested to provide that help. The new system assigned a high priority to lathe work. For example, if a lathe operator was at a mill when a batch on the lathe was completed, the operator was to stop the mill and return immediately to the lathe.

The lathe schedule was used to determine exactly what material was to be cut on the saw one day before it was needed in the lathe area. The material purchaser, in turn, used the saw schedule to determine exactly when to order within the semi-weekly order cycle. It was decided to not order on the last possible order date, but rather on the next-to-last date to provide some protection against unanticipated delays.

Set-ups were studied and improved. All possible work was done "externally" so that the lathe was stopped for as short a time as possible when changing between jobs. Lathe operators recorded actual job set-up and run times. These were compared to the current "estimates" used to bid and schedule jobs. The more accurate numbers should improve future price quoting and capacity planning.

"Octane mix"

Once the breakeven throughput rate of $39.39/hr was established, the CIRAS team analyzed all recently completed jobs to determine the rate at which they actually generated cash. The numbers in the chart below (see Table 1), which represent real findings, show that the throughput on some jobs was well below the breakeven point while others were well above it. This enabled the company to look at the highest throughput jobs for a common factor that could be used to drive future marketing and pricing strategies to attract more of that type of work. Perhaps those jobs were run on the same machine or used the same kind of tooling or were the same type of material.

The CIRAS team completed an average throughput calculation on all the jobs for each customer. This allowed the company to see which customers were more profitable

Table 1. Throughput comparison for each job.

Customer	Job #	Pieces	Lathe #	Invoice Amount	Material Costs	Contribution	Set-Up + Run Hrs.	Throughput ($/Hr.)
JKL Corp.	12345	600	1	$720	$242	$478	16.75	28.54
JKL Corp.	12346	3,000	1	$7,710	$4,573	$3,137	50.25	62.43
XYZ Inc.	12347	1,000	2	$2,650	$384	$2,266	15.75	143.85
ABC Co.	123667	140	3	$1,128	$0	$1,128	26.25	42.99
JKL Corp.	124987	1,000	1	$790	$185	$605	26.00	23.29
XYZ Inc.	125349	32	3	$258	$27	$230	3.00	76.80

Table 2. Throughput comparison: Average for each customer.

Customer	Total Jobs	Invoice Amount	Material Costs	Contribution	Set-Up + Run Hrs.	Throughput ($/hr)
ABC Co.	10	$3,230	$541	$2,689	39.50	68.07
JKL Corp.	76	$47,680	$15,862	$31,681	752.00	42.13
XYZ Inc.	7	$5,509	$681	$3,133	38.00	82.46

to work with. The analysis showed that the biggest customer was not necessarily the one with the highest throughput rate. For example, a new company that was smaller than some existing clients generated money at a much greater rate. Centerville chose to focus greater efforts on attracting more work from this new customer (see Table 2).

Results

Data used in the early stages of a productivity improvement project are not always accurate, and this project was no exception. Improvements were completed in seven weeks with several positive outcomes in operations. The important result was that shipments, and therefore cash generation, went up not by the 30% hoped for in the estimate of potential improvement, but by over 60% the first six weeks!

Trouble

After completion of the project, data were sent weekly from Centerville back to CIRAS. Unfortunately, performance dropped off dramatically shortly after the end of what became "Phase I." A proposal was made for Phase II. The focus was to ensure permanent changes to the operational system so that new procedures could be sustained for the long haul.

Project objectives included a visual job flow system for the shop floor, implementing visual feedback of system performance information to all workers, getting cash management software fully functional, and organizing a continuous improvement team.

Results II

At the end of Phase II, Centerville management and CIRAS staff felt confident that the system changes now in place would allow the company to sustain its operational improvements. However, at that time (October 2003) the economic slow down hit Centerville's customers and the level of orders dropped off severely. There was not sufficient load to test either the management or the system, and, worse yet, there was insufficient cash coming in.

This is where the story becomes a tale of two companies. The significant improvement in operations from the CIRAS project was not enough to help Centerville remedy its biggest problem: the long-term shortage of cash that existed long before the project was started. The lack of cash finally caught up with the firm and it was forced to close its doors.

Company #2

BK Machining, a smaller machine shop, has since opened in Centerville. "In light of Centerville Machining's failure," you might ask, "how was a new company able to attract an investor who was willing to step up and financially back them?" Well, the valuable lessons learned while applying concepts from the theory of constraints to Centerville Machining served as the starting point for this new company. Centerville's primary investor had observed the improvements in operations from the CIRAS project and was willing to put his money on the line to back this new company.

BK Machining has a bright future. Though smaller, they are now profitable and looking to expand operations. Specifically, the owners are looking for 15-inch-diameter lathe (turned) parts and machine center parts (milling) in the form of solid steel parts, aluminum castings, and weldments. They also plan to expand the number of employees as their business increases.

For more information on productivity improvement issues, contact Mike Willett, CIRAS, at 319-433-1286; mwillett@ciras.iastate.edu or Tim Sullivan, CIRAS, at 515-722-0656; sullytt@ciras.iastate.edu.

IMEP to reorganize

Iowa State University Extension is working with the Iowa Manufacturing Extension Partnership (IMEP) Governance Board and the Department of Commerce's National Institute of Standards and Technology (NIST) to change the structure of the IMEP. The goal is to expand services to Iowa manufacturers and implement a more coordinated delivery system.

Ron Cox, director of ISU Extension's Center for Industrial Research and Service (CIRAS), will serve as IMEP's interim director. Cox will continue to direct CIRAS during the interim. Willem Bakker, former IMEP director, has taken a job with the Missouri Enterprise Business Assistance Center as its president and CEO.

IMEP is part of a nationwide network of not-for-profit centers in over 400 locations whose sole purpose is to provide small- and medium-sized manufacturers with the help they need to succeed. The centers, serving all 50 states and Puerto Rico, are linked together through NIST. Centers are funded by federal, state, local, and private resources to serve manufacturers. That makes it possible for even the smallest firms to tap into the expertise of knowledgeable manufacturing and business specialists all over the United States. These specialists are people who have had experience on manufacturing floors and in plant operations.

Each center works directly with area manufacturers to provide expertise and services tailored to their most critical needs, which range from process improvements and worker training to business practices and applications of information technology. Solutions are offered through a combination of direct assistance from center staff and outside consultants.

Iowa IOF projects are on target

The Industries of the Future (IOF) is a successful U.S. Department of Energy (DOE) Office of Industrial Technologies program that was initiated to boost industrial efficiency by reducing waste and pollutants, lowering raw materials and energy use per unit output, and improving overall labor and capital productivity. The following nine energy and waste-intensive industries comprise this focus: agriculture, aluminum, chemicals, forest products, glass, mining, metal casting, petroleum refining, and steel.

Four years ago Iowa launched its own state-level IOF program, funded by the DOE and aligned with the national vision and roadmap for achieving goals in productivity improvement by 2020. The Iowa IOF (IIOF) is a cooperative effort with Iowa companies interested in developing and incorporating advanced technologies and best practices to industry operations. In addition to DOE support, the program's partners include the Iowa Department of Natural Resources, CIRAS, the Iowa Energy Center, and the University of Northern Iowa.

This past year, aspects of the program managed by CIRAS have focused on gathering and consolidating information, the bulk of which will form the basis for future action and policies. Currently, the IIOF has two active sessions—water/wastewater and food processing.

Water/Wastewater

The water/wastewater group, which is led by ISU Extension Civil Engineer Stephen Jones and CIRAS Industrial Specialist Mike Willett, continues to build partnerships between industry, manufacturers, research institutions, and government agencies. CIRAS IIOF activities have focused on

- the formation of a steering committee consisting of industrial representatives from Iowa's major cities
- the creation of a vision and roadmap document identifying future goals and direction
- the successful dissemination of information on IIOF activities, accomplishments, and ongoing efforts

The Iowa vision for water/wastewater industries (both manufacturers and utilities) identified the following areas for additional research and follow-on programs:

- develop incentive programs that encourage water conservation
- develop new programs to identify and reduce water leakage
- investigate programs and methods to reduce water volume usage
- implement off-peak water/wastewater pumping programs and incentives
- identify and implement new water/wastewater processes including process control optimization
- educate and encourage manufacturers and utilities to adopt regular water/wastewater audits
- improve and strengthen water/wastewater technical assistance and audit programs

Food Processing

There are more than 700 food processing companies in Iowa. The range of activities in this sector varies from retail-related services to basic processing in nearly all of the major food groups. Activities targeted to accomplish IOF objectives are confined to industries dealing with meat products, cereal grain processing, wet corn milling, livestock feed processing, and soybean processing. Employers representing over 50 percent of all Iowans working in these sectors participated in energy conservation studies. Both internal and external conditions affecting operations were taken into consideration. IIOF activities focused on

- energy-efficiency improvements
- productivity improvements in processing operations
- waste stream reduction

The wide range of activities undertaken and the competitive nature of mature companies in this sector limit the ability to share specifics of any one company's efforts to improve operations. However, certain topics or programs generated more interest than others. More typically, however, the interest was guarded and, at times, limited in scope. Areas that were earmarked for follow-on programs included

- streamlining the process for getting permits to make in-plant changes to systems requiring licensing
- expanding the use of college/technical interns for process improvement programs
- more intense use of individualized assessment programs that can help companies identify and incorporate specific process and energy-use improvements
- long-term commitment to creating and supporting dialog between researchers, academics, and technical leaders within various sectors of the food processing industry

Follow-on activity is key to getting maximum benefits from this effort. This includes working with industries on assessment issues that can help companies make strides in using energy more efficiently. Although a limited range of food processors participated in the study, the benefits were judged to be of value across the industry, which traditionally requires energy usage.

For more information on water/wastewater, contact Stephen Jones, ISU Extension civil engineer, at 515-294-3957; sejones@iastate.edu or Mike Willett at 319-433-1286; mwillett@ciras.iastate.edu. The complete IIOF water/wastewater report is available at www.ciras.iastate.edu/IOF/PDF/WWw-VisionRoadmap.pdf.

For more information on food processing, contact Merle Pochop at 712-274-0048; mpochop@ciras.iastate.edu. The complete IIOF food processing report is available at www.ciras.iastate.edu/IOF/PDF/IIoF_Year3_FoodProcessing_Findings.pdf.

Nondestructive evaluation support still available to Iowa companies

By Brian Larson, CNDE

Brian Larson, Center for NDE, works with a client to view the internal features of a component using real-time radiography.

Twelve years ago, CIRAS helped introduce Iowa manufacturers to a new industrial outreach program that was launched to provide access to the expertise and specialized equipment of the Center for Nondestructive Evaluation at Iowa State. For those not familiar with nondestructive evaluation (NDE), it is a collection of tools and techniques used to detect defects and measure characteristics of a component without impacting its future usefulness. Examples of NDE methods are x-ray and ultrasonic inspections, which are fairly familiar due to their use in the medical industry. In the manufacturing industry, NDE is used to gauge or improve product quality, reduce waste, and limit liability.

The NDE outreach program is still going strong and continues to benefit from a close relationship with CIRAS. The program was originally known as the Iowa Demonstration Laboratory for Nondestructive Evaluation. The name changed when the Institute for Physical Research and Technology (IPRT), a network of research centers at Iowa State, grouped its three industrial outreach programs together under the title of IPRT Company Assistance. This was done to eliminate a few unnecessary titles and streamline access to the outreach services available through IPRT. IPRT Company Assistance brings the NDE group together with a materials group from the Ames Laboratory and a contract research group. The NDE group and the materials group focus on short-term technical assistance, while the contract research group facilitates research projects with experts across the university.

Initiating assistance is as easy as making a phone call or sending an e-mail. Assistance can range from simple consultations to fairly involved studies. An economic development grant from the state allows staff to spend approximately 40 hours on a project at no cost to the company. Within the 40-hour time frame, most technical assistance projects can be brought to a conclusion or to a stopping point, resulting in useful information. If a company wishes to pursue additional work, a proposal for contract research can be prepared at the company's request.

The NDE group completes 35 to 50 projects each year in support of Iowa companies. Projects commonly involve one or more of the following elements:

- explaining and demonstrating various NDE methods
- developing or evaluating inspection techniques and procedures
- performing feasibility studies to determine if NDE methods will work for a specific application
- assisting with the interpretation of QA/QC requirements
- disseminating information on NDE equipment and services

The science of NDE evolved from the need to find critical defects in components used in high-risk industries, such as aerospace and nuclear, where failure of a component could have very serious consequences. Today, however, NDE methods are commonly used by companies large and small to monitor and control processes and to collect data for quality improvement initiatives.

For more information on NDE methods, contact IPRT Company Assistance at 877-251-6520; iprtinfo@iastate.edu; www.iprt.iastate.edu/assistance.

About IPRT Company Assistance

IPRT Company Assistance provides access to world-class expertise and equipment to help Iowa manufacturers and entrepreneurs address technical problems and R&D needs.

IPRT is a network of scientific research centers at Iowa State University and has been assisting companies from all corners of Iowa since 1987. Each year IPRT helps about 200 firms—from one-person start-ups to Fortune 500 corporations—solve scientific and engineering problems.

New jobs and increased sales mark assistance to western Iowa companies

By Bob Coacher, IMEP

Over the past few years, the Iowa Manufacturing Extension Partnership (IMEP) and CIRAS have partnered to provide technical and business assistance to numerous manufacturers in western Iowa. Following are examples of three manufacturing companies that have reported significant improvements in their business operations as a result of this assistance.

Omaha Standard Inc. is located in Council Bluffs and has approximately 225 employees. Founded in 1927, the company offers a wide selection of truck equipment, including hoists, Eagle Lift tailgates, building service bodies, dump bodies, stake bodies, contractor bodies, and all-purpose truck bodies.

Omaha Standard has been aggressively pursuing quality and productivity improvement in business operations. The company understood that it needed help to accomplish this task in order to survive in today's ever-challenging marketplace. To identify and eliminate, the company turned to IMEP and Iowa Western Community College for lean manufacturing training. At the same time, CIRAS provided ISO 9000 Quality Management System training, which helped to provide a baseline for continuous improvement and also identified areas of greatest opportunity. Jeff Tilley, vice president of engineering and manufacturing for Omaha Standard Inc., reported increased sales of $4,000,000, retained sales of $2,000,000, and cost savings of $1,000,000. Tilley said, "We have come a long way with our improvement program and have made some really exciting changes." Omaha Standard recently began construction of a new 200,000-square-foot manufacturing plant in Council Bluffs to replace three existing facilities that total over 280,000 square feet. "None of this would have been possible without our efforts in quality and lean. We've turned around our business and are now a growing organization," said Tilley.

Mastercraft Furniture Company is also located in Council Bluffs and has more than 50 employees. This 80-year-old company manufactures furniture for homes and businesses nationwide. Mastercraft Furniture was purchased by Nadler Brothers Company, who, under the direction of the company's president, Barry Nadler, relocated operations from the original sprawling 130,000-square-foot plant in Omaha, Nebraska, to a new 66,000-square-foot facility in Council Bluffs.

Prior to moving to the new plant, Nadler realized there was an immediate need for determining new factory layout and equipment placement. He contacted the Council Bluffs Chamber of Commerce, which, in conjunction with various units including IMEP, CIRAS, and Iowa Western Community College, worked with the Nadler Brothers Company to achieve the necessary objectives.

CIRAS assisted in plant simulation and the layout process, which helped the company predetermine ways to modify operations and at the same time achieve significant productivity improvement. In addition, Mastercraft Furniture received assistance in redesigning existing machinery to help improve product throughput. "The plant layout helped significantly in the move by preprogramming on the factory floor the placement of the equipment. Additionally, it reduced the moving time significantly. The new floor plan enhanced the flow of product, making production much more efficient," said Nadler.

The initial impact of the project was that Mastercraft made an investment of $2,000,000 in new plant operations and equipment and created 45 new jobs for Iowa. One year after the move, Nadler reported increased sales of $2,000,000, retained sales of $2,000,000, and operational savings of $200,000.

Companies benefit from many services

IMEP is a statewide network that provides technical and business assistance to small and mid-sized manufacturers. CIRAS is a service provider partner of IMEP. Local IMEP account managers (AM) meet with clients to answer questions, identify areas for improvement, and provide resources for increasing productivity and competitiveness. AMs also provide a third-party evaluation service to help partners and clients understand the full impact of projects completed within the system.

For more information on IMEP and CIRAS assistance, contact the following individuals:

- *IMEP, Bob Coacher, 877-965-4637; rcoacher@imep.org*
- *ISO 9000 Quality Management System, Merle Pochop, CIRAS, 712-274-7323; mpochop@ciras.iastate.edu*
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- *Manufacturing and Accounting Software, Steve Vanderlinden, CIRAS, 563-336-3318; svanderlinden@ciras.iastate.edu*

MEDTEC, Inc., is located in Orange City and has over 100 employees. The company was founded in 1983 and is a global leader in the design, development, and distribution of oncology products and systems essential for accurate cancer diagnosis and treatment.

MEDTEC needed to update its management information systems that connected all its other major manufacturing and accounting systems. Particularly, the company required a system that linked all of the information and could be easily accessed for timely management decisions.

Using "SoftSelect Systems," a computer software selection program, CIRAS helped MEDTEC select the Enterprise Resource Planning (ERP) system. The system saved the company a significant amount of management time by creating a process to define requirements, research software packages, select the best-fit software, and, finally, assist in software implementation. With the ERP system in place, the company recently reported over $2,000,000 in bottom-line savings. This project also involved IMEP and Northwest Iowa Community College.

Company benefits from reorganized work flow

Continued from page 1

orders. The Des Moines facility is surrounded by other factories and buildings, so expansion was not possible. Therefore, the existing space needed to be used more efficiently.

Carnine, who had read about CIRAS' work in plant layout, contacted Industrial Specialist John Van Engelenhoven to discuss possible improvements to his facility. Van Engelenhoven could tell that the flow in the Cummins Great Plains facility was very linear and therefore not conducive to a specialized computer simulation. Instead, it was determined that Cummins needed help rearranging racks to free up floor space for an additional engine upfit line.

"CIRAS worked to break the process into different components and address different areas. The biggest help was in layout," says Carnine. Van Engelenhoven and CIRAS undergraduate assistant Gregory Zink modeled alternative layouts using a CAD program. When these were presented, CIRAS and Cummins staff decided that rotating the storage racks 90 degrees would open up substantial space. This solution could have presented a challenge in working around building columns, but layout options were drafted that avoided the problem altogether.

Van Engelenhoven and Zink combined the drawings into one final design, which was then presented to Cummins Great Plains decision makers, including Carnine, Operations Manager Dale Koenig, and Upfit Foreman Mark Berg. With Carnine's approval, preparations were made to rearrange the facility. Koenig and Berg led the reorganization of the plant, making the drastic change over a long weekend. In all, only one and one-half days of production were lost as a result of the transition.

Now that it is arranged according to the layout design, Cummins Great Plains looks little like it did before the project. Storage racks run perpendicular to the direction they once did, creating aisles that are more easily accessible. In addition to upfit cells for large engines, an assembly line has been added for servicing smaller and more uniform engines.

The new layout has allowed Cummins Great Plains to increase the number of engines processed per month. Changes made to the plant have yielded $100,000 in savings. In addition, the company has invested in more material handling equipment and created one new job. Material is flowing more smoothly and production has increased. The company doesn't anticipate any problems with processing an increased number of orders. The project was conducted in collaboration with the Iowa Manufacturing Extension Partnership.

For more information on how CIRAS can help your company with material handling or plant layout, please contact John Van Engelenhoven at 515-294-4475; jve@ciras.iastate.edu.

Students key to success

Iowa State University students working on CIRAS projects bring an immense wealth of knowledge and practical skills to complex problems requiring solutions. Aerospace engineering student Gregory Zink is no exception.

Zink has been working part time at CIRAS since January 2004 on projects ranging from plant layout to product development and testing. Zink came to ISU as a National Merit Scholar, a testament to his exceptional academic credentials. He is president of the ISU chapter of the American Institute of Aeronautics and Astronautics and a member of Sigma Gamma Tau, the aerospace engineering honor society.

Currently, Zink plans to enroll in a one-year, fast-track master's degree program. His area of emphasis is computational fluid dynamics (CFD), using numerical methods on computers to solve complex fluids problems. After he graduates, Zink hopes to get a CFD job in the design of business jets.

CIRAS wins national awards

At the annual University Economic Development Association (UEDA) conference held recently in Orlando, Florida, CIRAS received national recognition for projects in three categories: special assistance, technical assistance, and partnering.

The UEDA (formerly NAMTAC) is a not-for-profit association providing advocacy, information, and a forum to enhance the performance of university-based organizations and their affiliates that offer economic development, business, and technical assistance to businesses and communities.

The UEDA is unique in that it focuses on the university's role in economic development and provides a forum for a diverse membership, with the common goals of enhancing enterprise competitiveness and community wealth. The UEDA project-of-the-year award goes to members identified as helping clients to become more globally competitive, more viable in their fields of expertise, or more capable of delivering services.

In the area of special assistance, CIRAS was recognized for its exemplary effort in organizing a series of three biodiesel awareness workshops in collaboration with experts from Iowa State University, the USDA, ISU Extension, and private industry held at the Iowa Energy Center's Biomass Energy Conversion Center. To date, CIRAS Industrial Specialist Rudy Pruszko and his team have conducted 16 workshops throughout the state of Iowa with 416 attendees from 38 states and 16 foreign countries. Workshop topics were on business management for biodiesel producers, biodiesel analytical methods, and biodiesel production technology.

CIRAS also received a UEDA technical assistance award for assisting Thomas Enterprises, an Iowa company that manufactures game controllers used in racing simulation software. CIRAS Industrial Specialist Andy Bice helped the company upgrade its controllers with USB ports to become compatible with today's PC technology. The project led to a 90% increase in sales and boosted the company's market standing to become one of the nation's top manufacturers of racing game controllers equipment. The project came to CIRAS through the Iowa Manufacturing Extension Partnership and received funding from the Institute for Physical Research and Technology at Iowa State.

From left: Andy Bice, Steve Devlin, and Rudy Pruszko

In the partnering category, CIRAS was recognized for unique leadership in bringing together several entities, including Iowa State and the USDA, to launch a new biobased products initiative as defined by the Farm Security and Rural Investment Act of 2002. The act requires federal agencies to purchase biobased products that meet certain set standards. CIRAS Industrial Specialist Steve Devlin partnered with federal officials, manufacturers, universities, and the private sector to develop a USDA Certified Biobased product label, as well as a computer-based management information system, a long-term operations management system, and an outreach process for future programs.

For more information on UEDA's mission and scope, visit the Web site at www.universityeda.org.

TOC Insights series

CIRAS announces a series of four educational sessions based on the business approach known as the Theory of Constraints (TOC). Most people's first encounter with TOC was through the popular business novel ***The Goal*** by Eli Goldratt, North River Press, 1984. That book has sold several million copies in countries across the world. It has inspired many to copy the actions of Alex Rogo, the plant manager in the book. However, because it is a novel, many people have requested more detailed "how to" information on implementing TOC. This series provides the most detailed technical information yet published by Goldratt on these four subjects.

All sessions are being held at the ISU Outreach office in Urbandale at 10861 Douglas Avenue. Start time is 8:30 a.m. and the sessions end at noon. Cost is $39.

- TOC Insights into Finance & Measurements
  Wednesday, March 30, 2005
- TOC Insights into Operations
  Wednesday, April 27, 2005
- TOC Insights into Distribution & Supply Chain
  Wednesday, May 25, 2005
- TOC Insights into Project Management
  Wednesday, June 29, 2005

For more detailed information or to register, call the Urbandale office at 515-727-0656 or find the appropriate date on the "Events" calendar on the CIRAS home page at www.ciras.iastate.edu.

Frequently asked questions about IAC

The Industrial Assessment Center (IAC) at Iowa State University helps manufacturers become more competitive and energy efficient. Here's a quick look, in question-and-answer format, at IAC and the services it offers.

Q. What is the Industrial Assessment Center (IAC) program?
A. *IAC is a program funded by the U.S. Department of Energy that provides no-cost assessments for saving energy, reducing waste, and enhancing productivity. IACs are located at 26 universities nationwide, including Iowa State University.*

Q. Who is eligible for IAC assistance?
A. *The program serves small- and medium-sized manufacturers. Assessments are confidential and participating plants are under no obligation to implement IAC recommendations.*

Q. What does an assessment involve?
A. *It's a three-step process: (1) an audit team conducts a survey and then tours the plant with a designated guide, who can answer the team's questions on plant activities and procedures relative to energy, waste, and productivity; (2) within 60 days of the on-site audit, the plant manager receives a confidential report with analyses and recommendations, along with cost estimates and payback periods; and (3) a follow-up call is made six to nine months later to determine which, if any, recommendations were implemented.*

Q. Who does the assessment?
A. *Students and professors do the engineering measurements and the students, with input from their professors, identify opportunities to increase productivity and decrease energy usage. Involvement in IAC is invaluable to students, providing hands-on experience in auditing key industrial operations, systems, and processes. In this way, the program enhances the energy awareness of future engineers. Greg Maxwell, associate professor of mechanical engineering, coordinates the ISU program.*

Q. What outcomes have participating manufacturers reported?
A. *Nationwide, IAC has saved American companies more than $700 million through efficiency and productivity improvements. IAC recommendations have saved enough energy to power a town the size of Boston for an entire year. The program has also helped to create and maintain more than 1.5 million U.S. industry jobs. Assessments yield recommendations that can save a manufacturing plant $55,000 annually on average.*

For more information or to determine if your company qualifies for a free IAC audit, visit the IAC Web site at www.me.iastate.edu/iac or the DOE's industrial technology Web site at www.oit.doe.gov/iac. Greg Maxwell may be reached at 515-294-8645: gmaxwell@iastate.edu. The IAC program at ISU was featured in the Fall 2004 issue of CIRAS News. *It's available online at www.ciras.iastate.edu/publications.asp.*

New staff member assists with energy efficiency projects

Alexandre Kisslinger joined the CIRAS staff in September 2004, bringing to CIRAS experience in the area of industrial energy efficiency technology. He previously worked with Iowa State University's Industrial Assessment Center (see article in Fall 2004 ***CIRAS News***) where he focused on energy projects in HVAC (heating, ventilation, and air conditioning), compressed air, steam, refrigeration, motors, heat recovery, and lighting applications among others. Kisslinger also participated in 45 energy audits at different industrial facilities. The audits required data collection and analyses and also provided recommendations based on the findings.

"Iowa manufacturers are becoming more aware of energy efficiency measures due to energy costs and industry pressure to cut costs for increased profits," says Kisslinger.

Kisslinger has an undergraduate degree in mechanical engineering from ISU and has recently completed his master's degree in ME. An avid sportsman, Kisslinger enjoys rowing, tennis, soccer, and volleyball. He also has a passion for traveling and learning about other cultures.

For more information on how CIRAS can help your company with industrial energy efficiency, please contact Alexandre Kisslinger at 515-294-3080; akisslinger@ciras.iastate.edu.

Correction

The CIRAS 2004 Annual Report in the last issue of ***CIRAS News*** incorrectly stated, "A productivity improvement-training project with Schumacher Elevator in Denver helped the company achieve an 84% increase in shipped products per week, which translates into an annual net profit increase of approximately $300,000 and 12 saved jobs."

The correct company was Centerville Machining, Inc., in Centerville, Iowa, and not Schumacher Elevator in Denver.

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INSIDE

WebWatch: Increasing productivity

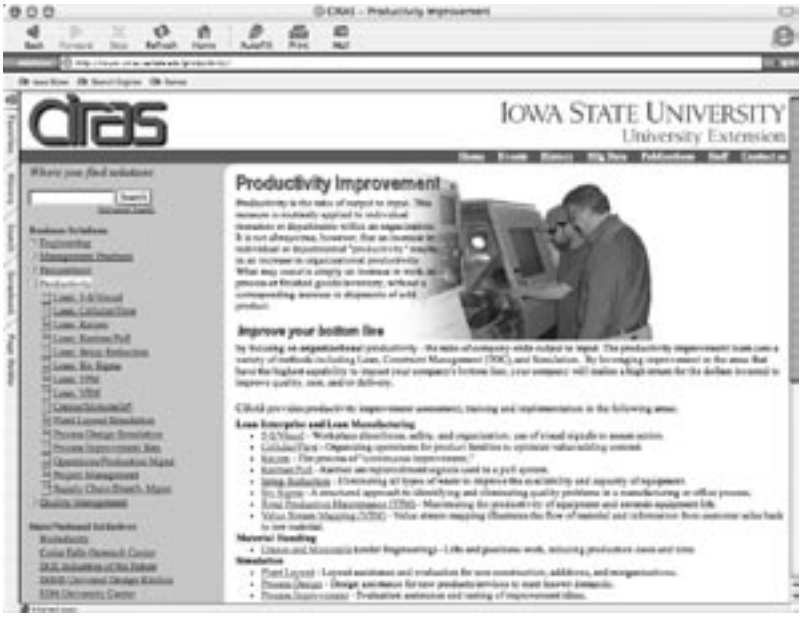
www.ciras.iastate.edu

Increasing individual or departmental productivity won't necessarily result in greater organizational productivity. To optimize your company's return on investment, you need to leverage areas with the greatest capacity to impact your bottom line. CIRAS can help by providing services in the following areas:

- Lean Enterprise and Lean Manufacturing
- Material Handling
- Plant Layout/Simulation
- Theory of Constraints (TOC)

For more information on productivity improvement, log on to the CIRAS Web site at www.ciras.iastate.edu and click on "Productivity."

CIRAS. . .providing solutions for Iowa businesses for more than 40 years.



Focus: Productivity

CIRAS News is published quarterly by the Center for Industrial Research and Service and edited by the CIRAS publications team. Design and production is by Engineering Communications and Marketing, Iowa State University. Contact John Van Engelenhoven at 515-294-4475 or jve@ciras.iastate.edu with questions and comments regarding the newsletter.