

INSIDE

# Developing a product that counts

by Helen Randall, HKR Communications

CIRAS  
moves to Howe Hall

Page 3

Improving indoor  
air quality

Page 4

CIRAS  
at a glance

Page 5

Client studies

Page 6

Job Shop  
Management

Page 11



*For more than a year, a team of CIRAS engineers and students worked with AATI to design and build-to-manufacture the Rapid Bacterial Detector, or RBD, which would put the scientific breakthroughs of AATI to work in the marketplace.*

Sometimes a project comes along that you know will be one of the great ones. That was the case with the product development work done by CIRAS for Advanced Analytical Technologies, Inc. (AATI).

"This project consumed a great amount of time, energy, and the talents of many here at CIRAS and elsewhere within the university from 1998 into 1999—and it was worth every bit of the investment," said Don Eichner, CIRAS engineer who headed the project team.

The RBD tests for bacteria and other contaminants in streams of liquid more quickly and accurately than previous technology had allowed. This state-of-the-art technology puts lasers and flow cytometry to work.

The primary impact of the RBD will be in food and beverage, wastewater, recreational waters, and pharmaceutical arenas, according to Shelley Coldiron, one of the founders of the company. Coldiron recently left AATI to rejoin the research and academic ranks of the Iowa State University chemistry department. Previous technologies required days to determine if sample liquids contained contaminants. That translated into several production cycles.

## The student factor

As the industrial outreach arm of Iowa State, CIRAS is committed to relating real-world industry problems to engineering students at the university. Throughout the AATI project, a group of about 10 advanced undergraduate engineering students worked alongside AATI scientists and CIRAS specialists to develop the RBD.

Ben Taylor, 23, a December 1999 ISU graduate in mechanical engineering, worked as a student intern and co-op student at CIRAS throughout the AATI project. He was involved in all phases, from initial concept meetings to design, assembly, and testing.

"I learned a lot working with the wide variety of people," Taylor said. "I was able to work with everyone involved, from the machinists to the vendors to the chemists. It's been beyond my initial expectations in terms of real job experience."



*Ben Taylor, a December 1999 ISU graduate, worked on the AATI project from early stages to completion.*

Taylor said working with the interdisciplinary project team helped him realize "the world doesn't revolve just around the engineers. There are other sides to the product design process. There are business and marketing factors to be considered."

"Working with CIRAS and AATI to design and build the RBD gave our students hands-on experience on a break-through product," noted Don Eichner, CIRAS engineer who took the lead on the project. "It was demanding work for them at times. But it had to have great rewards in terms of experience and excitement." ■

### CIRAS Mission Statement

CIRAS mission is to assist Iowa manufacturing to improve its operational performance. CIRAS will collaborate with the Iowa Manufacturing Extension Partnership program and its partners in fulfilling its mission. CIRAS will employ delivery methods consistent with Iowa State University's outreach efforts. It will engage in education and training programs for its clients to assure that managers and staff of clients are aware of current technical and managerial practices. It wishes to be recognized as the preferred source of unbiased information for the industry.

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# CIRAS moves to Howe Hall

by Jim Black, CIRAS



Our CIRAS home page, [www.ciras.iastate.edu](http://www.ciras.iastate.edu), includes a map showing the location of Howe Hall.

1. Next to the photo of Howe Hall is the text, "CIRAS has moved to new offices in [Howe Hall](#) on the ISU Campus. [Here are the details of our move.](#)
2. Click on "[Here are the details of our move](#)" for a campus map with a view of the area surrounding Howe Hall.
3. For an even larger map, click on "[Here is a large detailed map including Ames and CIRAS's location within Howe Hall.](#)"

Recommended parking locations include:

1. Visitor parking west of the Armory on Bissell Road.
2. Visitor parking west of Town Engineering (SW corner of Bissell Road and Pammel Drive).
3. Memorial Union parking ramp (NE corner of Lincoln Way and Lynn Avenue).
4. Metered parking along Sheldon Avenue.

Additional visitors' spots may become available in Lot 3 (south and west of Howe Hall). For more information or to arrange for a tour of our offices, call 515-294-3420.

On October 18, we started unpacking boxes in our new offices on the southeast corner of the second floor of Howe Hall. By the middle of the week, we were again serving client companies.

Howe Hall hosted the annual Order of the Knoll gala on Friday, October 22, and was dedicated the next morning. CIRAS staff members were on hand at these events for demonstrations and tours of our offices. Later on Saturday, the Millennium Ball was held at Howe Hall.

The new offices are part of the \$63-million Engineering Teaching and Research Complex, which will include Howe Hall (Phase I) and the yet-to-be-built Hoover Hall (Phase II). In an interview with *Inside Iowa State* for the October 22, 1999, issue, Engineering Dean Jim Melsa stated:

*The goal has always been to create a more practice-oriented and collaborative approach to engineering education. We feel we have done that in Howe Hall. We have the high-tech space needed to provide not only a high-quality educational experience for undergraduate and graduate students, but also for engineers throughout their careers. This is a facility dedicated to the idea that engineering is a profession based on a lifetime of learning.*



## Steve Devlin joins team

CIRAS welcomes Steve Devlin as the newest member to the central staff in Ames. Devlin is a design specialist with the design group. His responsibilities will include the development of documentation processes, management of the rapid prototype system, implementation of a benchmarking system for computer-aided design (CAD) software, and training student employees with the CAD system for project development. Devlin is also interested in alternative agriculture product development, product analysis and testing, manufacturing processes, OSHA compliance management, and construction management.

Prior to joining CIRAS, Devlin worked as a product designer at John Deere Des Moines Works. He graduated from Truman State University, Kirksville, Mo., with a BS in industrial science, and is currently pursuing a graduate degree at ISU in industrial technology.

Steve and his wife, Colleen, reside in Ankeny. His other interests include recreational boating, rugby, and English bulldogs.

# Improving indoor air quality

by Ron Cox, PhD, CIRAS

*Editor's Note: This is the second part of a two-part series.*

The Fall '99 issue of *CIRAS News* highlighted an indoor contaminant that has recently received a lot of media attention—carbon monoxide.<sup>1</sup> Carbon monoxide is one of a variety of contaminants that employees may be exposed to in a manufacturing plant. Other common airborne contaminants include welding smoke, dust, process vapors, and volatile organic compounds. One of four recommendations made in the *CIRAS News* article was to “use plant ventilation to dilute and remove CO.” In this article, we expand upon that recommendation and give examples of a number of methods for dealing with indoor contaminants.

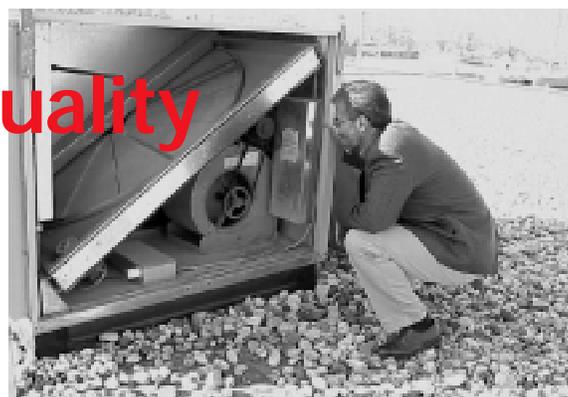
Many Iowa manufacturers ventilate their plants with either natural ventilation (doors and windows), mechanical ventilation (wall or ceiling exhaust fans, paint booths, make-up air units, etc.), or a combination of the two methods. Unfortunately, as outdoor temperatures fall, employees often shut doors and windows to keep the plant warm. As doors and windows are closed, exhaust fans, paint booths, and dust collection systems can be starved for air if there is not a sufficient supply of make-up air. The performance of ventilation systems can then degrade and the building pressure may decrease to a point where downdrafting of combustion vents occurs, creating an additional health risk.

Air quality does not refer exclusively to contaminants either. Excessive humidity levels in a plant can also lead to manufacturing problems. High humidity levels can hasten mold growth and corrosion of metals. Variations in humidity can cause paper to expand and contract, causing difficulties for printers. High humidity levels can significantly slow the rate at which process drying occurs.

There are four main strategies for improving indoor air quality:

- eliminating or reducing sources of contamination
- capturing contaminants at the source followed by cleaning and re-circulation or exhaust
- diluting by increased ventilation
- general air cleaning

General air cleaning is usually not favored since it is typically inefficient to try to remove contaminants after they have been dispersed. Here we focus on the first three approaches.



CIRAS agent Ron Cox examines the sheave settings on an energy recovery ventilator at Stoyles Graphic Services in Mason City.

Eliminating or reducing contaminants is often the most overlooked, yet possibly most economical method of improving indoor air quality. Approaches include:

- **Design of products** Efficient design of products can reduce contaminate generation.
- **Improved manufacturing processes** Some processes can be enclosed to contain contaminants or another process that generates fewer contaminants might be substituted.
- **Tune equipment** Adjusting machinery can significantly affect contaminant production. As pointed out in the Greiner article on LPG-powered forklifts,<sup>1</sup> “Less than one turn of the jet adjusting screw can change CO emissions from 50,000 ppm to 500 ppm without a noticeable change in engine operation, exhaust color, or exhaust odor.”
- **Proper operation** The correct operation of machinery can have a large impact on indoor air contaminants. By employing proper painting methods, the Iowa Waste Reduction Center’s STAR program (Spray Technique Analysis and Research) has reduced material by 29% and cut hazardous air emissions by 31%.

The second method of improving plant indoor air quality involves containment and removal of the contaminant before it escapes into the work environment (local source control). If the contaminant is diluted by plant air, a much greater volume of plant air must be exhausted or cleaned to remove the contaminant. Hood design is important and can have a large impact on the effectiveness of the extraction process. Flexible-arm fume extractors can be used if the source moves within a region.

Once the contaminated air is extracted, it can be exhausted to the atmosphere, cleaned and then exhausted, or cleaned

<sup>1</sup> Greiner, Tom, *Manage risk of LPG-powered forklifts*, *CIRAS News*, Vol. 34, No. 1 Fall 1999.

Continued on page 9

From the Director, **Richard Grieve**

*Few years go by without both major accomplishments and major changes at CIRAS. The 1998–99 fiscal year was no exception.*

**First, some major accomplishments:**

- CIRAS wrapped up a year and a half of product development and testing work with Advanced Analytical Technologies, Inc. (AATI), a new company located in the ISU Research Park. CIRAS' role was to design and build-to-manufacture a device known as the Rapid Bacterial Detector, or RBD, a scientific breakthrough in quickly identifying bacteria in streams of liquid. It represents CIRAS' largest contract/fee project to date. Many staff and students were involved.
- For the second year in a row, CIRAS received the National Association of Management and Technical Assistance Centers (NAMTAC) Outstanding Project of the Year Award, this time in the category of technology transfer for the product design project with AATI.
- We marketed and delivered a nine-week, intensive satellite course on theory of constraints (TOC) to 15 locations across the state, using the Iowa Communications Network (ICN). The series featured Eli Goldratt, known as the international guru of TOC. It drew 299 people, the largest turnout in the world produced by any sponsoring group. CIRAS is delivering various programs to individual manufacturers as followup.
- CIRAS responded to a growing interest by agricultural sectors in traditionally manufacturing-oriented practices, particularly ISO 9000. CIRAS specialists visited processing and production facilities in Europe to see how ISO standards are being applied there and to examine potential for U.S. ag businesses. A meat processing company has contracted with CIRAS to work with them on becoming ISO certified. It is only a beginning.

*On the change front, you will see shifts in the budget. Cost recovery accounts for more dollars. This has been expected. The Iowa Manufacturing Extension Partnership (IMEP) input was slightly smaller. A growing source of funds for CIRAS is grant funding.*

## CIRAS at a glance

### Linking Industry and Resources

**C**IRAS has been the industrial outreach arm of Iowa State University for the past 36 years. Its purpose is to connect Iowa manufacturers with resources they need to find solutions to problems and to improve processes and practices.

CIRAS' many educational and assistance services fall under four broad categories: product development and testing, quality and process improvement, manufacturing practices, and simulation.

Currently, 12 industrial specialists are strategically placed across Iowa to bring areas of specialized education and on-site assistance to manufacturers. Six additional specialists and several support staff work out of the central ISU office to connect manufacturers' needs back into the university.

Partnerships—with the university as well as with agencies outside the university—are how CIRAS is able to best meet the varied needs of Iowa industry. Primary ISU connections are with the College of Engineering, ISU Extension, the Center for Advanced Technology and Development, the Institute for Physical Research and Technology, and the Ames Laboratory.

CIRAS communicates regularly with nearly 6,000 manufacturers and industry supporters through its quarterly newsletter, *CIRAS News*. The CIRAS web site (<http://www.ciras.iastate.edu>) received 241,009 raw hits and 34,925 visitors from July 1998 through June 1999. These figures do not include internal use. Between July 1, 1998, and June 30, 1999, CIRAS made contact with 4,492 different firms, including 13,746 individuals.

In addition to its multiple university connections, CIRAS is a partner in the Iowa Manufacturing Extension Partnership (IMEP), which is part of ISU Extension and is funded by the National Institute for Standards and Technology. IMEP serves to increase federal and other state resource support for manufacturers. Within this alliance, CIRAS works closely with the Iowa Community College system.

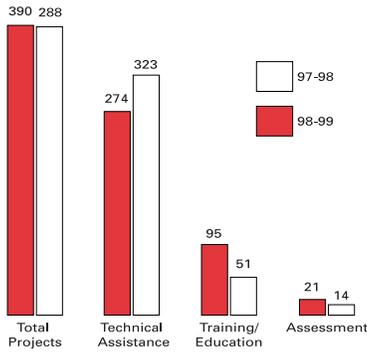
Small- and mid-sized manufacturers are primary targets of CIRAS outreach. Expertise and research capabilities of CIRAS also are utilized by larger firms.

In the 1998–99 year, CIRAS involvement began to include agriculture production and value-added agriculture enterprises. While CIRAS has always worked with some manufacturers in the ag sector, assistance in such traditional manufacturing areas as standards (ISO 9000), company feasibility studies, and supply practices are being requested by producers and processors. ■

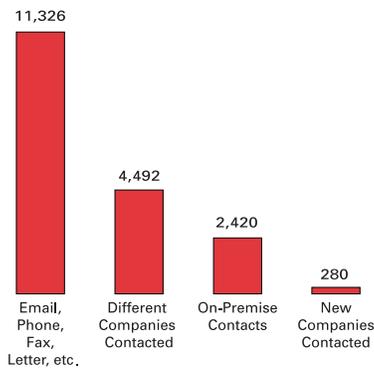
*“CIRAS was critical in moving our product from the design stage to a product ready for use by technicians in commercial settings.”*

Shelley Coldiron  
Co-founder,  
Advanced Analytical  
Technologies, Inc. (AATI)

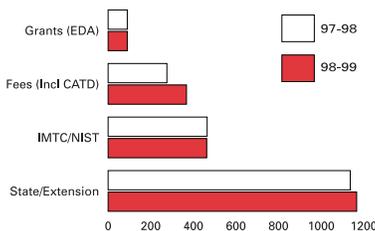
## Types of Projects



## CIRAS Contacts



## CIRAS Budget



## Client studies

### Hammer's Plastic Recycling Corp., Iowa Falls

**Challenge:** Hammer's, which manufactures a diverse line of products using recycled waste plastics as a material source, had the opportunity to enter into a new market with a new product. The product is a cradle to hold huge spools of steel used to make large items, such as household appliances. The company needed to establish strength parameters through formal testing procedures.

**Action:** CIRAS recommended the Iowa Companies Assistance Program (ICAP) for testing and served as liaison between the material testing lab and the client. CIRAS also observed and assisted in testing procedures.

**Outcomes:** Testing established that the product exceeded strength standards that were required in the market. The company indicated encouraging sales of the new product.

**Agent:** Jon Clancy

### North Iowa Area Community College, Mason City

**Challenge:** Local companies had requested training in investigative techniques. North Iowa Area Community College (NIACC) contracted with CIRAS to provide that educational service.

**Action:** A four-hour workshop on investigative techniques was provided to 18 people, representing five companies. Topics included root cause analysis, Weibull analysis, and other similar techniques.

**Outcomes:** One hundred percent of participants agreed that the instructor's knowledge of the subject was good or excellent; seventy-five percent rated the course as "excellent" (from course evaluation forms).

**Agent:** Ron Cox

### Specialty Oil Processing, Vinton

**Challenge:** Owners of Iowa Soy Specialties, which processes soybeans into flour, needed a feasibility study of their new venture, specialty oil processing, in order to secure a substantial Rural Development USDA guaranteed loan. Working under the direction of the Value-Added Ag Program and funded by the Rural Economic Value-Added Mentoring Program (RE-VAMP), both at ISU, CIRAS provided expertise in areas of financial and technical feasibility. The new company was to be the first plant in the country to use new technology in processing soybeans into niche markets of smaller quantity specialty oils.

**Action:** All areas of feasibility concerns—economic, marketing, technical, financial, and management—as required by the Rural Development USDA loan program, were woven together into a comprehensive analysis of the company. CIRAS agents explored the new machinery to be purchased and used by the company on the basis of technology, plant layout, and operational factors, looking into how the technology was handled in its larger form in other processing facilities. Information was gathered from business owners, the inventor of the machinery and the company that would provide technical and start-up support to the Vinton company. CIRAS agents also prepared a complete cash-flow analysis and break-evens in order to show viability of the company at different stages of its start up and later years. A computer analysis program was applied.

**Outcomes:** The loan guarantee was granted based upon findings and recommendations of the feasibility study. The company has delayed implementation due to other corporate factors.

**Agent:** Denzil Stacy, Jeff Mohr, and Lloyd Anderson (retired CIRAS director)

## Almaco, Nevada

**Challenge:** Almaco, which makes specialized agricultural equipment, had added 9,500 square feet of space in 1997 and needed to add another 12,000 square feet of space in 1999. They wished to have a plant layout for improving space use and to include the company's 44 work areas. The building shape already was decided.

**Action:** A team was formed to work with the CIRAS agent in considering space use and needs and to apply a systematic process to considering possible plant layouts. The move was to accommodate more engineering work. Computer modeling was used and, due to the nature of the team work involved, varying factors and benefits were considered.

**Outcomes:** The plant layout simulation and planning was completed in April and the move into the larger facility took place. The company received drawings and documentation to review benefits of the layout and to analyze relationships within the plant at future dates.

**Agent:** Jeff Mohr

## Woods Quality Center (WQC), Cedar Rapids

(Woods Quality Center participants include Rockwell, Centro, VMI, Square D, Pickwick, DAD, Genecore, United Way, World Class Industries, Intolerance, CIVCO Medical, Midwest Metal Products, NCS, Engineered Seal Products, Evergreen Manufacturing, Parker Hannifin, and others.)

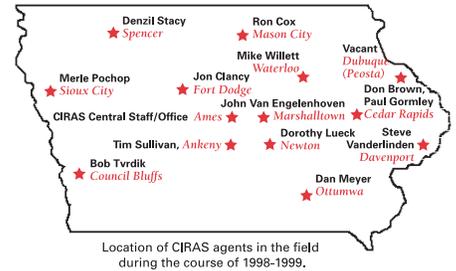
**Challenge:** Members who were implementing ISO 9001 or 9002 requested that WQC provide internal auditor training to meet the ISO requirements. CIRAS, as a member of WQC and holding a license for quality training materials, offered the training. The alternative would be for companies to bring in a consultant or send employees out of state.

**Action:** CIRAS provided ISO internal auditor training as an ongoing educational service, beginning in 1995 and continuing through 1999 on a quarterly basis. This has been a cooperative effort between CIRAS, a local consultant, companies, and Kirkwood Community College. The group developed a unique internal auditor training curriculum that includes the students conducting an actual audit of an ISO-certified company.

**Outcomes:** Member companies, primarily manufacturers, from the Cedar Rapids/Iowa City area (with some out-of-state representation) have been able to meet the requirements for ISO certifications by training more than 230 employees to be auditors. These same companies, and new ones, continue

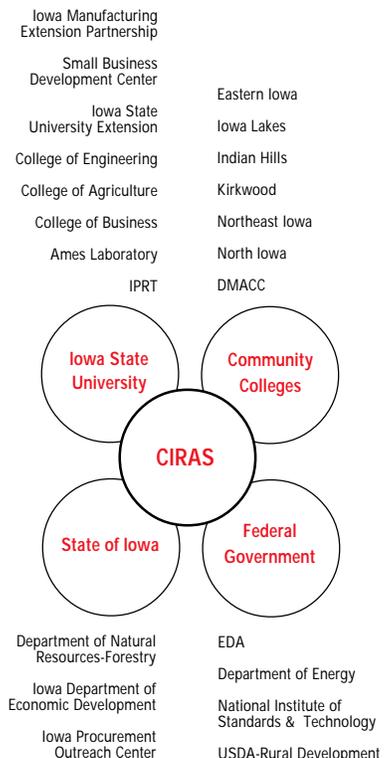
to send employees to be trained. CIRAS has maintained good relationships among the members in the WQC to facilitate the success of the project. The WQC has 160 members, representing 38,000 people.

**Agent:** Don Brown



*“Since 1998 CIRAS has played an increasing role in the value added ag sector in Iowa. As coop and producer groups look to export products to Europe, a need they face is for ISO 9000 certification. CIRAS is assisting these groups with ISO certification.”*

**Verlyn Anders,**  
Operations Manager, CIRAS



## On the horizon

- Value-added ag activity will continue to increase. That door has been opened by demand from beef, hog and grain production activity within the state as well as from ag manufacturing enterprises.
- We will begin to offer rapid prototyping services, enhancing our growing product design and development project work.
- We anticipate strong growth and demand in the areas of simulation (plant layout), standards implementation (ISO 9000 and related offerings), and product development and testing.
- The Iowa Procurement Outreach Center (IPOC) and staff are joining the CIRAS enterprise and will enlarge the scope of our support for Iowa manufacturers. IPOC links manufacturing vendors with large government contractors.
- Work will continue on making the CIRAS office at Cedar Falls an enhanced manufacturing activity center within the state—perhaps the first of several sites.

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*“New business formations and growth in existing ag businesses have brought increased funding requests to Rural Development. This federal organization has come to CIRAS in increasing frequency for feasibility studies of the businesses.”*

Verlyn Anders,  
Operations Manager, CIRAS

### Dodgen Industries, Humboldt

Source of unpleasant smell in new plywood paneling

### D.C. Welding, Wadena

Patent search on dairy farm sorting gate

### Fairview Farms, Corwith

Library search for techniques to produce edible soybean products

### Specialty Oil Processing, Vinton

Literature search on growth of organic food markets and soy oil processing techniques

### J&K Fabrication, Ridgeway

Patents on child-proof electrical device for home use

### McHugh Sales and Service, Sioux Rapids

Search for list of trade shows for builders in Iowa

### Sioux City Area Extension Office, Sioux City

Literature search on effects of electrical utility deregulation on the local economy

**Challenge:** Iowa manufacturers and economic development groups frequently have need for in-depth literature searches. Searches often relate to patents of new products or reviewing manufacturing technologies that are available to process raw agricultural commodities. Reviews of current literature may include exploration of consumer trends, evaluation of anticipated impact of new regulations, or problem solving related to materials involved in a manufacturing process.

**Action:** The CIRAS field representative in the Spencer area, in cooperation with an engineering research librarian at the ISU Parks Library, offered the needed service to Iowa manufacturers and economic development groups. Literature searching techniques and access to references not available to smaller libraries was an advantage to clients. By using electronic communications, information could be relayed quickly to clients.

**Outcomes:** Companies were able to use the information provided to make more informed decisions on operations and plans for the future.

**Agent:** Denzil Stacy

### Grimm Brothers Plastics Corp., Wapello

**Challenge:** Grimm Brothers Plastics Corp., which makes thermoformed plastic parts, was investigating the potential for a new product.

**Action:** CIRAS provided aerodynamic fundamentals and discussed strengths/weaknesses of the design. The company also was directed to web-based patent resources.

**Outcomes:** Based on findings and discussions in the investigation, the company is unlikely to continue to pursue the new product design.

**Agent:** Ron Cox 

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## Improving indoor air quality

Continued from page 4

and returned to the plant. The DNR's view of plant exhaust depends on whether the exhaust is fugitive in nature

or is a regulated pollutant. Air quality construction permits may be necessary if regulated pollutants are discharged through a vent, exhaust fan, or smokestack.

Methods to clean contaminated air depend on whether the contaminant is a gas or particulate. Gases can be removed by ventilation fans, paint booths, etc., but can also be cleaned by numerous chemical and physical processes if it is necessary to return the air to the plant. The cost of these methods must be weighed against the cost to replenish the exhaust air.

Methods to collect particulate contaminants are divided into two basic groups: filters and dust collectors. Filtering is used to remove low concentration levels of contaminants. The heavy loads associated with industrial settings are typically removed with a dust collection system. A variety of methods are available:

- Electro-static precipitators are commonly used to remove oil mists and welding smoke.
- Fabric collectors filter the air that passes through them; captured particulates are removed from the fabric by mechanical agitation or air motion.
- Wet collectors, or scrubbers, collect particulates by passing the air stream past a liquid; high temperature and moist streams can be handled.
- Dry centrifugal collectors are typically used to remove large particles from an airstream; the cyclone separator is one of the more common devices in this category.

The method and equipment chosen depends on numerous factors including type of contaminant, particle size distribution, particulate volume, flow rate, moisture level, cost, and contaminant disposal.

Dilution by ventilation is the third method of decreasing exposure to indoor air contaminants. This approach is conceptually simple—provide sufficient make-up air to the plant to dilute contaminants to safe levels. This is a common approach in many Iowa manufacturing plants that do not use air conditioning. Correctly sized roof- or wall-mounted vent fans, together with open windows and doors, can provide sufficient ventilation for three seasons. Unfortunately, if doors are shut during winter months, indoor air quality can suffer. Heated make-up air units, possibly with energy recovery technology, can be used to remedy this problem.

**CIRAS** recently worked with Bonser's Pasta Products in Agency, Iowa, to help the company with its humidity problems. After an initial analysis and a few tests, recommendations were made to slightly modify the process and room ventilation. According to Jerry Bonser, "By implementing CIRAS' suggestions, we have been able to increase production by 25-30% for less than \$250 in equipment."

To keep your employees and your company healthy and productive, it is important to understand what your employees are exposed to, what is being vented to the atmosphere, and what is the most efficient method of maintaining indoor air quality in your plant. OSHA regulates the quality of indoor air. Employee exposure to contaminants can be ascertained by implementing personal employee sampling, where employees wear a monitor for up to eight hours at a time. This data can be gathered by OSHA Consultation at no cost, by outside consultants for a fee, or possibly by your insurance company. If OSHA Consultation finds that employees are exposed to levels above their permissible exposure limits, then you must correct what they find. Questions concerning requirements should be directed to OSHA Consultation at 515-965-7162.

Information on DNR requirements concerning discharging contaminants can be obtained from DNR's Des Moines offices at 515-281-8189. The Iowa Waste Reduction Center at 800-422-3109 currently has a program to assist small manufacturers (less than 100 employees) with DNR permitting at no cost.

To ensure that your building meets applicable codes and standards, a qualified HVAC expert should conduct the design of a plant ventilation system.

CIRAS offers a number of services to assist manufacturers with improving indoor air quality. CIRAS personnel can

- take data on exhaust rates, plant pressure readings, and humidity readings to help manufacturers trouble shoot problems
- act as a neutral third party to assist manufacturers in understanding why competing vendors' recommendations for plant ventilation differ
- assist with the redesign of products to reduce contaminants in manufacturing

CIRAS can provide a variety of related services, including access to ISU wind tunnels to assess the aerodynamic performance of products, information on cooling tower performance upgrades, assistance with fan inlet and exhaust design, process drying, and aerodynamic advice. For more information, contact Ron Cox at 515-424-5432 or rcox@iastate.edu. 

## CIRAS again wins prestigious national award



The National Association of Management and Technical Assistance Centers (NAMTAC) selected the product design work on the Rapid Bacterial Detector, done for Advanced Analytical Technologies, Inc., of Ames, as the 1998–99 Outstanding Project of the Year in the technology transfer category.

The award was received in October and signifies the second consecutive year CIRAS has received the honor for one of its projects.

Last year, CIRAS received the Outstanding Project of the Year Award in the category of business assistance for its feasibility study of Sunrise Energy, a start-up ethanol fuel producing company in eastern Iowa that sought loan guarantees from the USDA Rural Development program.

## Developing a product that counts

Continued from page 1

By the time test results could reveal contaminants, several production cycles of product, time, and expense were involved—and wasted. The RBD test provides results in about an hour. Problems can be corrected in one-batch production cycles, avoiding the need to destroy finished goods.

Coldiron first contacted Eichner about designing and making the RBD prototype in April 1998. Phase I of the project brought the RBD to the demonstration stage, and Phase II allowed for testing and further modifications. In May 1999, the project was completed.

John Roberts and Jeff Mohr, CIRAS industrial specialists, and a team of about 10 engineering students were involved throughout the project. Other departments and centers at the university with whom CIRAS often collaborates were involved at various stages, including the Center for Advanced Technology Development (CATD); the Ames Laboratory electronic, machine, and sheet metal shops; the Department of Chemistry glass blowing shop; and others.

CIRAS staff and students used solid modeling, CAD, and other product development skills before parts for the RBD were fabricated.

“The solid modeling work was critical to the success of the project,” said Roberts, because it provided the following:

- parametric qualities, which allow for easier and quicker changes when part dimensions change
- associative properties, allowing individual part changes to be automatically updated in all assembly drawings
- form, fit, and function verification, showing interferences, parts alignments, and aesthetics prior to actual manufacture

“Not only has the AATI project and CIRAS’ role in the creation of the RBD received tremendous notice from the academic community and various business and scientific sectors, it also represents CIRAS’ largest contract/fee project to-date,” said Richard Grieve, director of CIRAS. He said the project is a shining example of how CIRAS can best work for Iowa companies and the university. “We brought together top-notch product development and technology transfer for the company and, at the same time, gave several students unmatched experience in real manufacturing application.”

The project was unique, Eichner noted, because of its highly interdisciplinary nature. “It required specialists and scientists with highly advanced knowledge in various fields to work closely together, understanding the operations of each other’s specialty,” he said. The RBD also was a first-of-its-kind prototype, which required constant testing of methods and product along the way.

The AATI and CIRAS story has not reached its conclusion, however. After a year of substantial growth and change, AATI has contracted with CIRAS for further project assistance, including assistance with documentation.

While the RBD originally was targeted for food, beverage, and pharmaceutical industries, markets have already expanded into water treatment and recreational waters, according to Coldiron. ■

Courses included in the Job Shop Management series:

- *All about ISO 9000*  
April 12, 2000
- *The Strategic Planning and Kaizen Cycle*  
May 10, 2000
- *Managing Human Resources*  
June 7, 2000
- *OSHA Compliance: The Basic Programs*  
July 12, 2000
- *Managing the Purchasing Function of a Firm*  
August 9, 2000
- *Constraint Management: Applying the Theory of Constraints (TOC)*  
September 13, 2000
- *Manufacturing Resource Planning (MRPII)*  
October 11, 2000
- *Financial Accounting for Non-Financial Managers*  
November 8, 2000
- *Cost Accounting and Quoting*  
December 6, 2000

# Job Shop Management

*In April, CIRAS will offer the first in its Job Shop Management series, a slate of nine courses designed to assist job shops with significantly improving performance and profitability.*

“This series is an educational alternative to the regular classroom offerings. For managers and owners of small- and medium-size companies, we think it is one of the best investments they could make.”

— Mike Willett, CIRAS Specialist

All courses are a day in length and will take place approximately monthly during this initial offering in northeast Iowa at the ISU Industry Outreach Center, 7103 Chancellor Drive, Suite 200, Cedar Falls, Iowa.

“This is a novel concept in bringing learning opportunities to industry in the state,” said Mike Willett, CIRAS specialist, who is directing the job shop project. “Rather than taking months-long courses that may or may not directly apply to the workplace, managers can gain the knowledge and skills needed to apply new techniques to their businesses. The courses represent needs expressed by our job shop clients in recent years and cover a range of topics that specifically apply to successful job shop operation.”

Those who complete six of the nine offerings will receive a Job Shop Management series certificate of accomplishment from CIRAS. CEUs also are available. Participants may choose the courses that best fit their needs. Willett said it is an ideal way for businesses to offer professional development and future earning potential to managers, perhaps even as part of a pay package or incentive program.

Cost of the entire series is \$2,000. Courses may also be taken individually for \$399 each. For course details, including information about flexible payment options, please contact Mike Willett at 319-266-3260, x1willett@exnet.iastate.edu, or Sarah Terrones at 515-294-5008, x1terron@exnet.iastate.edu.

## Cedar Falls has a new office

The ISU Industry Outreach Center opened on December 1 at the Cedar Falls Industrial and Prairie Technology Business Park. ISU will work with northeast Iowa industries to form science and technology partnerships to promote economic development. Michael Willett, CIRAS field staff, states, “This unique CIRAS location will provide on-site information on new technologies, technical assistance, and training from ISU and other partners. The center will also offer a full-service meeting facility.” An open house is being planned.



*ISU Industry Outreach Center  
7103 Chancellor Drive, Suite 200  
Cedar Falls, IA 50613*

Mike Willett 319-266-3260, ext. 203  
FAX 319-266-3395  
x1willett@exnet.iastate.edu

INSIDE

CIRAS moves to Howe Hall	Page 3
Improving indoor air quality	Page 4
CIRAS at a glance	Page 5
Client studies	Page 6
Job Shop Management	Page 11



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CALENDAR

**February 9, 2000: One-day workshop**  
**“What is the Goal? An Introduction to TOC”**  
Location TBA in Waterloo. Cost \$199 for the first person, \$125 for each additional person from the same company. Register with Sarah Terrones, 515-294-5008. For more information contact Tim Sullivan, 515-965-9355.

**February 8, 2000: Greater Quad Cities Women/Minority/Small Business Owners**  
Networking Breakfast – Lady Luck Conference Center, Bettendorf—7:30 am – 8:30 am. Cost \$8.00. Register with Kathy Bryan, 800-458-4465, or e-mail kbryan@ciras.iastate.edu.

**February 22-24, 2000: ISO 9000 Internal Auditor Training**  
Co-sponsored by Don Brown, CIRAS, and Woods Quality Center. For more information please contact Don Brown, 319-398-1272.

**March 9, 2000: Des Moines Women/Minority/Small Business Owners Networking Breakfast**  
Downtown Holiday Inn, Des Moines. Cost \$8.00. Register with Kathy Bryan, 800-458-4465, or e-mail kbryan@ciras.iastate.edu.

**April 4, 2000: FastTrac Business Planning for Manufacturing Seminar**  
Kahl Building, Davenport—6:00 pm – 9:30 pm. Registration \$350. For registration please call Jon Ryan, 319-335-3404, or Steve Vanderlinden, 319-335-3318.

**April 11, 2000: Greater Quad Cities Women/Minority/Small Business Owners Networking Breakfast**  
Lady Luck Conference Center, Bettendorf—7:30 am – 8:30 am. Cost \$8.00. Register with Kathy Bryan, 800-458-4465, or e-mail kbryan@ciras.iastate.edu

**May 3, 2000: Minority and Women Business Expo Conference**  
Polk County Convention Complex, Des Moines. For more information contact Kathy Bryan, 800-458-4465, or e-mail kbryan@ciras.iastate.edu.