



Collaborating to Predict Machine Failure

A Davenport manufacturer of electrical safety devices is prototyping a new product intended to help equipment operators predict when their machines will fail.

The new system, which is expected to be released within the next year, will use special sensors created by Davenport-based Grace Technologies integrated with predictive algorithms using an Internet of Things (IoT) architecture. The technology has grown out of a collaborative, CIRAS-supported research effort between Grace and Iowa State University.

Grace Technologies has estimated that its new system could be worth up to \$10 million to the company over a five-year period as equipment operators rush to save money on downtime, expensive repairs, and maintenance-related injuries.

Drew Allen, Grace Technologies vice president for strategic innovation, said large organizations in high-value industries have long had predictive maintenance capabilities because they use expensive equipment to monitor

rotary machines and detect vibration changes in bearings. Grace is one of many companies seeking to translate that technology to a broader market.

“In the past, it used to be that a huge generator at a utility company or a turbine at a nuclear power plant would use this, and maybe the system would cost \$250,000,” he said. “The difference is that we have systems that would be able to be placed on motors of all sizes and would cost a few hundred dollars.”

The Grace-Iowa State relationship began in 2018 when CIRAS project manager Carey Novak followed up on an unrelated capstone project involving Iowa State engineering students. Novak initiated deeper discussions about mutual interests in research and development, especially predictive maintenance and IoT, and connected Grace with Chao Hu,

an assistant professor in Iowa State’s Department of Mechanical Engineering. Hu also oversees the System Reliability and Safety Laboratory, which supports several undergraduate and graduate students conducting industry and academic research.

An initial project in 2019 was funded jointly by Grace Technologies and the CIRAS Technology Assistance Program (TAP). This was followed by two research projects funded by the Iowa Board of Regents’ Regents Innovation Fund and a two-year grant from the National Science Foundation (NSF). In December, the NSF also recommended \$256,000 for the research as part of the government’s Small Business Technology Transfer program.

Hu said Grace-related research involves using machine learning to

Continued on page 2

- 1 Collaborating to Predict Machine Failure
- 3 CIRAS Helps Latham Hi-Tech Seeds Have Smooth Spring
- 4 CIRAS Guides Grinding Improvement at Weiler
- 5 Online Orders Are an Elixir Following COVID-19 Collapse
- 6 CIRAS Supplier Scouting Helps Bring Business to Iowa
- 7 CIRAS Serves Iowa: By the Numbers
- 11 COVID-19 Assessment Helps Larson Ensure Best Practices during Pandemic
- 11 Upcoming Events
- 12 Spring Career Fairs
- 12 ILC Virtual Annual Conference Builds Lean Leaders
- 13 GovTalk—B2G Sales
- 13 For the Record
- 14 Mix of Ancient, Advanced Technologies Salvage Older Elevator
- 15 Persistent Bidding Helps Bowe Machine Break into Government Contracting
- 15 Contact Information
- 16 Growing Your Business

On the Cover: Venkat Nemani, left, and assistant professor Chao Hu pose next to a test stand where initial vibration research was conducted.

CIRAS Mission: *Every day we will enhance the performance of industry through applied research, education, and technical assistance.*

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create algorithms that can interpret bearing vibration data and predict when machines are close to failure. Companies will be able to monitor the health of bearings and rotors in different types of machines and (because of the IoT framework) do so with many machines simultaneously.

"This should help equipment manufacturers plan their equipment maintenance and avoid unplanned downtime," Hu said. "That could be of huge value to them. If a bearing breaks on a piece of equipment and there's no early warning, it's not only the bearing that fails. The shaft and other components around it can get destroyed, too. It's a cascading effect."

As part of the process, researchers have been engaging Iowa companies that support the new Kent Corporation Feed Mill and Grain Science Complex at Iowa State. In particular, the team is collecting feedback on what tools are needed to monitor machine health of pelletizers and milling and rolling equipment.

"We don't want this work to end up being just an academic exercise," said Hu, whose team already has submitted journal and conference articles for publication. "We want this to be practical and useful."

The Grace-Iowa State team also is assessing opportunities to file an invention disclosure and possible patent application sometime during the year. If successful, Grace Technologies would commercialize the technology through a licensing agreement with Iowa State's Office of Intellectual Property and Technology Transfer.

Novak described predictive maintenance as the "Holy Grail" for equipment manufacturers. Companies everywhere

are looking for a way to reliably predict that a machine is going to fail within a certain window—a warning that arrives early enough to schedule maintenance but not so early that valuable machine life must be sacrificed.

"If you know that a piece of equipment is going to fail in the next minute, that's useless," Novak said. "If you know that a piece of equipment is going to fail within the next 12 months but you don't know when, then that's useless as well."

Allen praised his company's partnership with CIRAS and Iowa State as a valuable way of helping small companies explore the impact of a new idea. Without Iowa State's research lab, test facilities, and faculty and student expertise, Grace Technologies would have been forced to spend tens of thousands of dollars to develop that capacity—with no real idea of what the payoff might be.

"Getting all the people assembled—the knowledge, the ability to do the research, the technical understanding of bearings—that was definitely beyond our capability by ourselves," Allen said.

Novak praised the partnership's value across the board, including Grace's support for Iowa State internships.

"This is what every university wants," he said. "When they talk about university innovation and an idea getting commercialized, this is the kind of team you want. You want a company working closely with the faculty while you're supporting grad students and others. It's a multifaceted system."

➤ **For more information, contact Carey Novak at cenovak@iastate.edu or 515-408-4257.**

A Grace Technologies sensor.



AT A GLANCE

Grace Technologies

FOUNDED: 1993

OVERVIEW: Manufacturer of electrical interface connectors, safety devices, and sensors.

EMPLOYEES: 50

IMPACT: Up to \$10 million over five years.

FOR MORE: www.graceport.com



Corn sits waiting for shipping at Latham Hi-Tech Seeds.

AT A GLANCE

Latham Hi-Tech Seeds

FOUNDED: 2009

OVERVIEW: Family-owned seed producer.

EMPLOYEES: 48

IMPACT: More than \$7 million in new sales, retained sales, and cost reductions over two years.

FOR MORE: www.lathamseeds.com



CIRAS Helps Latham Hi-Tech Seeds Have Smooth Spring

An Alexander, Iowa, seed company estimates it will gain more than \$3 million in new business over the next year, partly because CIRAS helped the company become more efficient in the face of rapid growth.

Chris Latham, chief financial officer for Latham Hi-Tech Seeds, said his company struggled to keep up with its orders for soybeans and seed corn in 2019 as it expanded into new markets in South Dakota. The increased business, along with a growing trend of farmers seeking to accept their seed as close to the beginning of planting season as possible, seemed to be creating bottlenecks.

"In 2019, the late spring saved us" from being late with orders, said operations manager Dan Erbes. "If we'd have had

"Sometimes it's just good to have that third party bring everybody together and agree on where the problems are. It was nice just to be able to bring everybody in and work through it all."

— Chris Latham

the (earlier) spring in 2019 that we had in 2020, we would have been in trouble."

The company reached out to CIRAS in summer 2019 seeking help with finding more short-term capacity. That led CIRAS project managers Marc Schneider, Andrew Friend, and Steve Wilson

to review Latham's operations, diagnose the bottlenecks, and work with staff to correct them.

Among other things, Schneider's team ultimately recommended that Latham address some workforce issues and

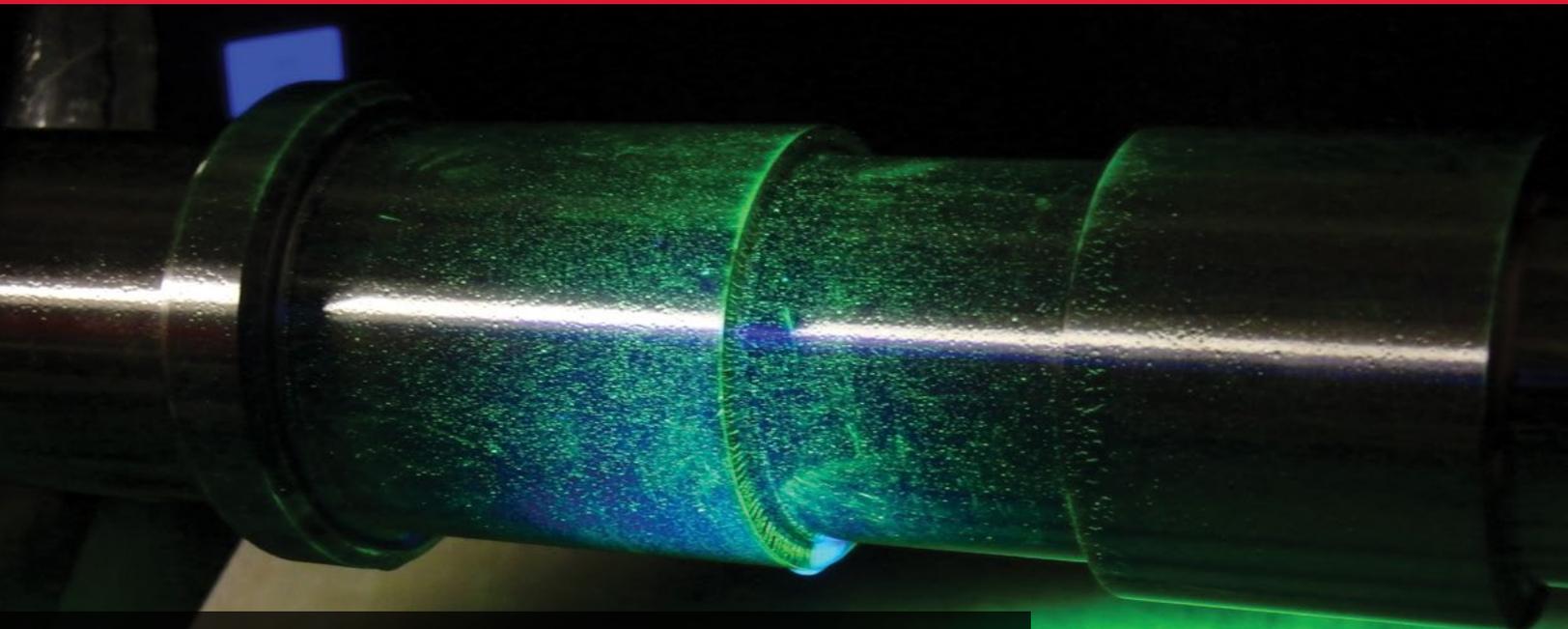
change the way it handles conditioning and packaging of beans so that the company could begin conditioning even before orders were filled.

"What they did for this season was a good first step," Schneider said. "But if the company continues to grow, they'll need to continue to invest."

Chris Latham said the changes helped the 2020 planting season run smoothly, and he praised CIRAS for playing a valuable role as an objective outside expert.

"Sometimes it's just good to have that third party bring everybody together and agree on where the problems are," he said. "It was nice just to be able to bring everybody in and work through it all."

➤ For more information, contact Marc Schneider at maschn@iastate.edu or 563-221-1596.



Above, magnetic particles are drawn to the crack sites on a steel drill. Cracks appear as fine yellowish-green lines under florescent light. Below, drill shafts await testing.

CIRAS Guides Grinding Improvement at Weiler

A Knoxville-based heavy equipment manufacturer estimates that the company retained more than \$10 million in sales after CIRAS helped it solve a problem with cracking shafts on a rock drill used in highway construction.

Mark Prachar, a project engineer with Weiler, said the company took control of a new process for making components for its rock drills in 2018—only to find cracks in the shafts produced. Company engineers, many of them Iowa State University graduates, turned to CIRAS for help diagnosing the problem.

“We didn’t have the testing equipment in-house to know what was happening on the surface or just below the surface of the part, because we had never done it before,” Prachar said. “We were changing things, and it wasn’t improving the result, and we needed to know why.”

Dave Utrata, a CIRAS project manager who works in Iowa State’s Center for Nondestructive Evaluation (CNDE), used a combination of ultraviolet light and tiny magnetic particles to help the company pinpoint sources of cracking and understand what was going wrong.

“To make rock drills, you need really hard materials,” Utrata said. “When you grind that material into final shape, it’s really tricky to grind it properly. If you don’t do it exactly right, it will overheat, then contract too much—and that leads to cracking.”

Prachar said CIRAS expertise helped the company zero in on correct grinding procedures. Weiler experimented with new techniques throughout the end of 2018, regularly taking parts to Utrata for evaluation.

“CIRAS helped us hone in on the specific type of failure that we had,” Prachar said. “It helped us develop our grinding process and in-house NDE inspection techniques.”

Weiler estimates that CIRAS helped the company avoid an estimated \$10 million in lost sales.

AT A GLANCE

Weiler Inc.

FOUNDED: 2000

EMPLOYEES: 450

OVERVIEW: Manufacturer of heavy-duty equipment for the asphalt paving market.

IMPACT: An estimated \$10.5 million in retained sales and reduced costs.

LEARN MORE:
www.weilerproducts.com



“Through the CIRAS analysis, we found there is an art to the grinding process,” Prachar said. “The resources that CIRAS provided helped us find a timely solution and expertise we can call on again in the future.”

➤ For more information, contact Dave Utrata at heydave@iastate.edu or 515-294-6095.

Online Orders Are an Elixir Following COVID-19 Collapse

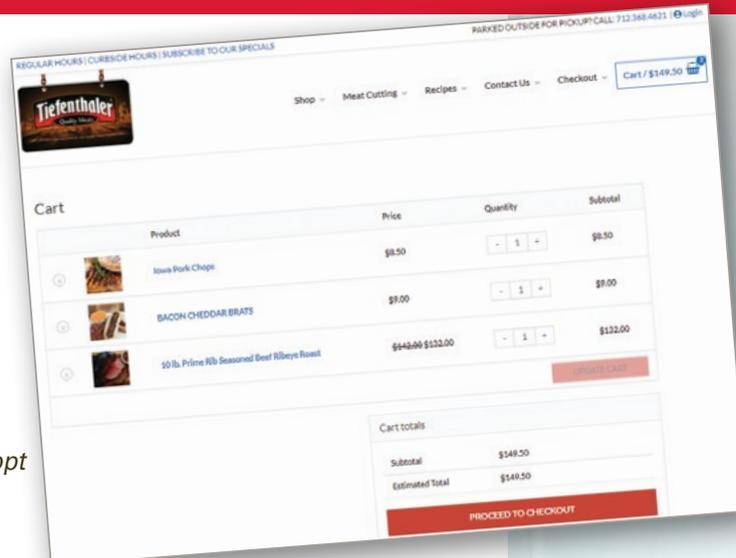
A Holstein, Iowa, meat producer now finds itself on the cusp of full-blown e-commerce thanks to a computerized online order system that the company was driven to adopt in response to COVID-19.

Tiefenthaler Quality Meats, a family-owned company known for its skinless brats and other meat products, originally approached CIRAS in March seeking help managing the online portion of a yearly anniversary sale. However, those conversations soon shifted when pandemic safety concerns led Tiefenthaler's to close its retail store to customers. Tiefenthaler's also cancelled the anniversary sale because of the pandemic and its impact on business.

Co-owner Shelly Tiefenthaler said the company was confused about how to continue serving customers curbside-only, so she contacted CIRAS project manager Paul Gormley for help. Gormley and other CIRAS-affiliated experts helped Tiefenthaler's build a new online ordering system. On June 11, the company quietly turned on its new system and took roughly 350 orders during the first five days.

"It really has changed a lot of things," Tiefenthaler said. "Our staff now stays busy filling online orders, but it's much more efficient and organized now. We will be able to keep offering curbside service for those who don't want to come in the store for their own personal reasons. We opened the store back up to walk-in customers in late July, but the curbside system is still going strong."

The new digital storefront works with Tiefenthaler's existing point-of-



sale computer system, enabling online orders to flow directly into the company's existing software. While business remains down from prepandemic levels, online orders now make up roughly one-half of all retail sales.

Other companies may benefit from a similar approach, Gormley said. Businesses that don't feel like they have the logistical ability to track and fill online orders right now can still mimic larger competitors by offering the same curbside service.

"In the eyes of the customers, Tiefenthaler's looks like a very grown-up business if it's doing the same thing as major supermarkets," Gormley said. "And 'normal' e-commerce can come directly out of what it takes to do that."

Tiefenthaler said the company has not yet embraced full online sales because shipping companies can't yet guarantee timely delivery in a pandemic-altered economy. But the company believes it's on a good path, and it is thankful for CIRAS help salvaging its sales.

"CIRAS really helped us figure out the correct path, the correct way to do it," Tiefenthaler said. "Had I not worked with them, I'm not sure where I would have started."

➤ **For more information, contact Paul Gormley at gormley@iastate.edu or 319-721-5357.**



An order being assembled at Tiefenthaler Quality Meats.

AT A GLANCE

Tiefenthaler Quality Meats

FOUNDED: 1991

OVERVIEW: Family-owned meat locker producing, among other things, beef, bacon, jerky, and skinless brats.

EMPLOYEES: 20

IMPACT: More than \$950,000 from a variety of CIRAS projects over the last three years.

FOR MORE: www.tqmeats.com

AT A GLANCE

World Class Industries

FOUNDED: 1953

OVERVIEW: Supply chain management and assembly company.

EMPLOYEES: 200

IMPACT: Four new jobs and at least \$5 million yearly in new sales.

FOR MORE: www.worldclassind.com

CIRAS Supplier Scouting Helps Bring Business to Iowa

A Hiawatha-based assembly and supply chain integration company expects to see at least \$5 million a year in new business after CIRAS facilitated a partnership with an air purification company.

World Class Industries started work in October under a contract that quickly will see the company producing 24,000 room-sized air purifiers annually for Timilon Acquisitions.

Timilon, based in Florida, makes EnviroKlenz Air Systems. The devices use special filters and a fan inside a powder-coated cabinet to “remove at least 99.97 percent of the fine particulate matter from the air in your home or business.”

After growing exponentially for several years, Timilon needed additional capacity.

Tim Putnam, director of the Pappajohn Entrepreneurial Center at North Iowa Area Community College, said Iowa entrepreneur and Timilon investor John Pappajohn called him in May searching for Iowa companies that possibly could assemble EnviroKlenz purifiers. Putnam’s organization, which serves as a CIRAS partner in northern Iowa, then asked for help searching the entire state.

CIRAS project manager Adam Boesenberg used databases and input from other CIRAS experts to identify companies with the manufacturing capabilities, capacity, and quality necessary to meet the company’s needs.

Boesenberg and Putnam ultimately recommended six firms to Timilon, including World Class Industries (WCI). The company, which had first learned about Timilon from CIRAS strategy adviser Joy Donald, was chosen at summer’s end.

Ryan Murphy, director of business development for World Class Industries, said Timilon liked “our ability to scale with their business, as well as our capability to provide ideas throughout the process to improve the manufacturability of their product.”

George Negron, Timilon vice president, agreed.

“Everyone CIRAS identified was a great candidate,” Negron said. “You not only saved us time and effort, but we got more

“We foresee the business growing nicely throughout Iowa.”
— George Negron

out of it than we initially were looking for.”

Negron said several of the other finalist companies

could find future work with Timilon as the company expands. “We foresee the business growing nicely throughout Iowa,” he said.

Mike O’Donnell, program director for the CIRAS Manufacturing Extension Partnership (MEP), said supplier scouting requests usually come through a nationwide MEP system created to help government contractors who can’t find a qualified U.S. company making what they need.

“Internet searching and online directories are great, but sometimes you really need people who understand manufacturing,” O’Donnell said. “That’s where CIRAS and our MEP National Network make a real difference.”

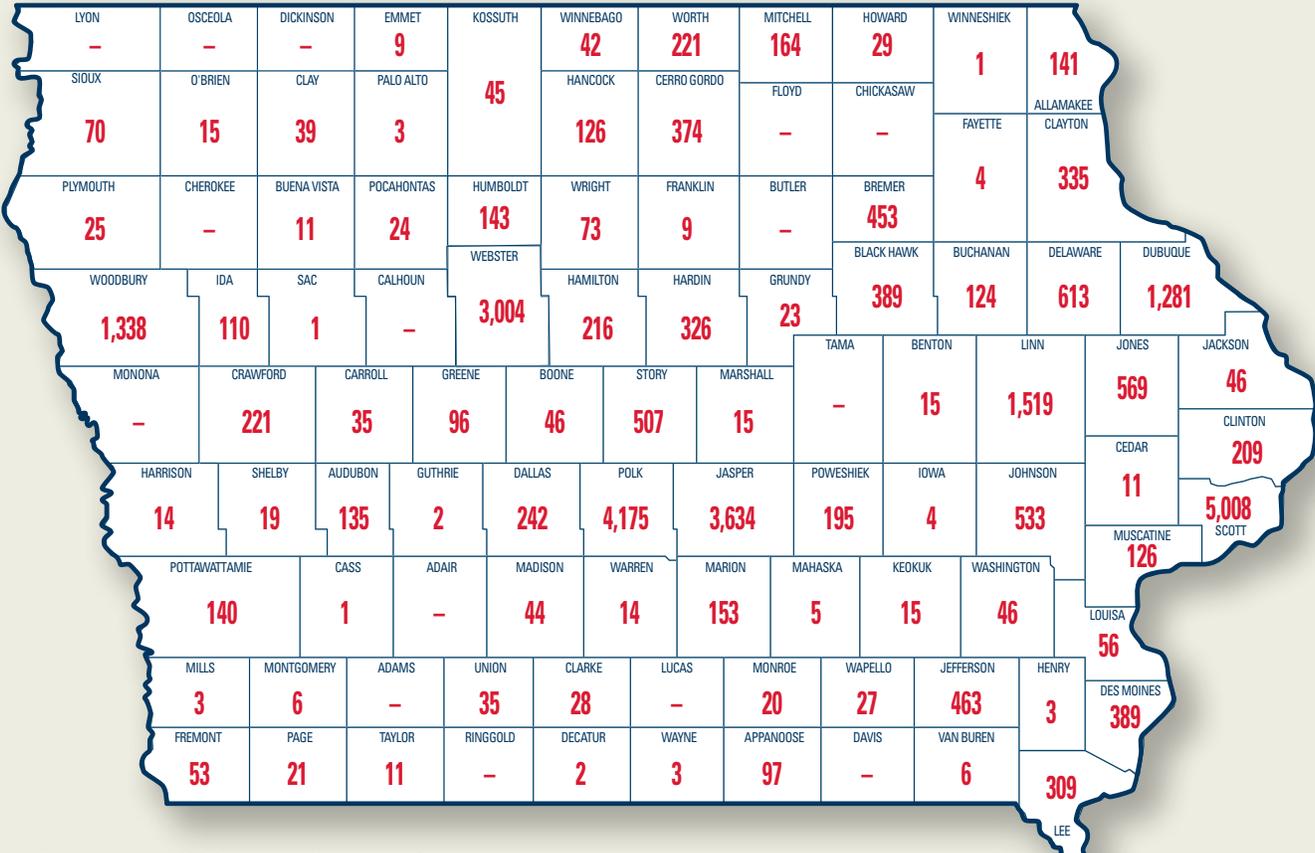
➤ For more information about supplier scouting, email the CIRAS Helpline at ciras.info@iastate.edu.

Assembling air cleaners at World Class Industries.



JOBS: More than 29,000 Added or Retained

Jobs Added or Retained, 2015–2019



Two Iowa companies impacted significantly when the COVID-19 pandemic arose last spring nevertheless were able to add or retain a combined 170 jobs after CIRAS helped them partner to make personal protective equipment (PPE).

Brownmed of Spirit Lake and Metalcraft of Mason City were two of many companies CIRAS contacted last March in response to looming Iowa PPE shortages as the coronavirus raged. To help PPE production ramp up quickly, CIRAS assisted Metalcraft and Brownmed with tooling and hard-to-get raw materials. These two companies alone ultimately produced far more than 1 million face shields, with some donated to local charities and others sold to hospitals and state agencies.

In addition to helping fill medical needs, both companies used the face shield business to keep their workers employed during the demand-cratering pandemic. Combined, the two companies saved



Face shield material at Metalcraft.

more than 100 jobs and added nearly 70 additional workers.

“Like many companies, in mid-March we essentially saw our core business dissipate overnight,” said Brandon Rodriguez, vice president of production management for Brownmed. “If it weren’t for the introductions CIRAS made, it would have been far more challenging for us to find the needed resources.”

“Obviously, we’re thrilled with how it went,” said Kyle Bermel, chief operating

officer at Metalcraft. “It was nice to have CIRAS to bounce ideas off of and great to work with Brandon and his team at Brownmed.”

Last year, CIRAS worked with companies across Iowa to add or retain more than 29,000 jobs. Those projects generated an economic impact of more than \$2.8 billion.

For more information, visit www.ciras.iastate.edu/covid-19/supply-chain-disruptions/.

CONNECTIONS: More than 4,100 Distinct Clients Served

Distinct Clients Served, 2015–2019



Iowa manufacturers know that competition eventually will require them to learn more about automation technology, including robotics and vision systems, Hank Norem believes. However, it remains difficult for most of them to make the leap.

“A lot of companies are looking at this technology, but they’re not adopting it yet,” said Norem, president of West Des Moines-based Ramco Innovations. “Working together with CIRAS, we can continue to educate companies on automation and hopefully make them stronger in the long run.”

Ramco is one of three partners helping CIRAS expose Iowa manufacturers to cutting-edge technology through Iowa State’s Digital Manufacturing Lab powered by Alliant Energy.

Opened in September 2019, the lab helps Iowa companies filter the noise surrounding new technologies. Manufacturers can explore options, find the right application for their business,



Ramco employee educating at a CIRAS event.

then evaluate it before investing.

Other CIRAS technology partners include Computer Aided Technology (a 3D printing and scanning company in West Des Moines) and MakuSafe (a West Des Moines safety, data, and analytics company).

Chris Hill, director of the CIRAS Technology Assistance Program (TAP), said local partnering relationships help CIRAS access new technology while meeting an important goal of connecting companies and keeping investment dollars inside Iowa.

With help from partners, CIRAS hosted six Digital Manufacturing Lab tours between September 2019 and March 2020, when COVID-19 closed the physical space. After shifting to virtual, CIRAS hosted more than 20 online technology events between March and November 2020.

CIRAS has worked with more than 4,100 companies over the past five years on projects with an economic impact of more than \$2.8 billion.

For more, visit
<https://newswire.ciras.iastate.edu/category/digital-manufacturing-lab/>

WORKFORCE PIPELINE: More than 2,400 Interns Placed

Iowa State University interns at Iowa companies, 2019



Henderson Products is a big believer in its partnership with Iowa State University engineering students.

Last fall, the Manchester manufacturer of multipurpose equipment for heavy-duty work trucks launched three yearlong projects with Iowa State seniors. The capstone projects involved teams of senior engineering students working to improve the ergonomics of equipment on a dump body production line and studying the safest way for employees to remove parts from large laser tables.

Jerry Sigwarth, continuous improvement engineering manager at Henderson, said capstone projects are a perfect way for the company to focus additional resources on nagging problems or test the feasibility of new ideas. Students can help answer important questions “that wouldn’t normally make it to the top of the priority list.”



Iowa State alumni working at Henderson Products in Manchester.

But Henderson Products has a deeper interest as well, Sigwarth said. Working with Iowa State students gives the 450-person company a perfect opportunity to present its best face to a valuable future workforce.

“We take a lot of pride in being customer- and results-driven,” Sigwarth said. “Any opportunity to gain exposure and help potential talent understand what Henderson does, what the culture is, and what the opportunities are helps set us up for the future. Through

capstones and internships, we’ve recruited some very strong talent from Iowa State University. This will be crucial as we continue to improve, engage, and grow as a company.”

Iowa State University sent more than 2,400 interns to hundreds of Iowa companies like Henderson last year. Those students were employed at businesses stretching through 91 Iowa counties.

For more, visit www.ciras.iastate.edu/ciras_services/capstone-design/.

COVID-19 Assessment Helps Larson Ensure Best Practices during Pandemic

Like most responsible companies navigating a pandemic, Larson Manufacturing worked hard to secure its Lake Mills manufacturing facility against COVID-19. Among other things, the company posted signs, upgraded its cleaning procedures, and installed social distancing barriers. But was that enough?

To make certain, Larson last summer became one of Iowa's first companies to receive a CIRAS virtual COVID-19 Preparedness Assessment. CIRAS can offer these and other assessments at no cost thanks to funding from the Coronavirus Aid, Relief, and Economic Security (CARES) Act through the NIST Manufacturing Extension Partnership.

"Even though we felt we were doing pretty well, we thought we'd seek out the opportunity to find out if there were any gaps we needed to fill," said Brian Throne, Iowa operations manager for the door and window company. "I think we learned a lot."

CIRAS experts spent several hours over the course of three weeks evaluating the company on 65 criteria spread across 13 areas. Company leaders used video conferencing, email, and a secure file-sharing tool to discuss COVID-19 policies and procedures and to share photos and videos with the CIRAS team.

The result? CIRAS experts identified several areas where Larson could do things such as increase visual controls at entry points and aid cleaning efforts by removing some nonessential items from work areas.

CIRAS project manager Marc Schneider described the changes as "minor things," such as upgrading quickly assembled social distancing markers (8.5" by 11" printouts taped to walls) to larger, more permanent signage.

"Part of our purpose was just to validate that what they were doing made sense, and they weren't missing anything," Schneider said. "The biggest thing was helping them transition to the long term."

➤ **For more about COVID-19 assessments, contact Marc Schneider at maschn@iastate.edu or 563-221-1596.**



Updated signage at Larson Manufacturing.

AT A GLANCE

Larson Manufacturing Co.

FOUNDED: 1954

OVERVIEW: Largest manufacturer of storm doors and storm windows in the United States.

EMPLOYEES: 240 in Iowa

IMPACT: Peace of mind, better plan for a future event.

FOR MORE: www.larsondoors.com

Throne said Larson also plans to improve the clarity of some written policies.

"This was a really comprehensive review," he said. "I think we'll come away from this with a better plan for any future event."

■ **Weekly COVID-19 Roundtable for Manufacturers**
Tuesdays
 7:30 a.m.
 Online presentations on a weekly topic followed by questions and answers.

■ **Virtual Lean Coffees**
3rd Friday each month
 9:00 a.m. to 10:15 a.m.

■ **Using beta.SAM.gov**
February 15, 2021
 Webinar exploring the government's website for finding potential bidding opportunities.

■ **Capabilities Statement**
February 24, 2021
 Webinar explaining what a capabilities statement is, why it's important, and how to draft and share one.

■ **Sales Strategy for 2021**
February 26, 2021
 Webinar to help leaders understand the key dimensions of strategy.

■ **Subcontracting**
April 7, 2021
 Webinar to help businesses understand subcontracting opportunities and where to find them.

For details on these and other events, visit www.ciras.iastate.edu/events-workshops.

Spring Career Fairs

■ Business, Industry, and Technology Career Fair

Thursday, February 25, 2021

10:00 a.m. to 5:00 p.m.

Virtual (short, online video meetings)
(focuses on business, liberal arts and sciences, and human sciences)

CONTACT: bcs@iastate.edu

■ Design Career Fair

Wednesday, February 24, 2021

10:00 a.m. to 5:00 p.m.

Virtual

CONTACT:

designcareers@iastate.edu

■ Engineering Career Fair

Tuesday, February 16, 2021, and

Wednesday, February 17, 2021

10:00 a.m. to 5:00 p.m.

Virtual

CONTACT: ecs@iastate.edu

■ People to People Career Fair

Tuesday, February 23, 2021

10:00 a.m. to 5:00 p.m.

Virtual

(focuses on human/social services, education, health/wellness, government, and hospitality; hosted by the Colleges of Human Sciences and Liberal Arts and Sciences)

CONTACT: hscareers@iastate.edu

■ Teacher Education Fair

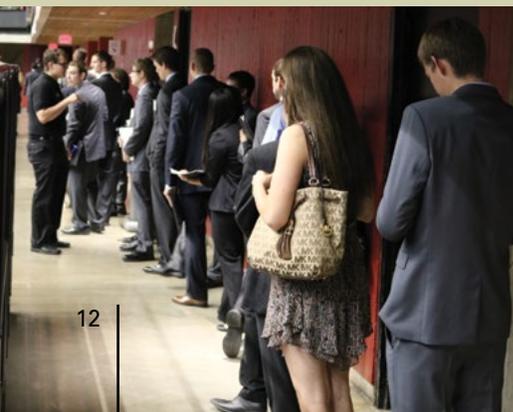
Monday, March 1, 2021

Noon to 4:00 p.m.

Virtual

CONTACT: hscareers@iastate.edu

Students wait for interviews during a pre-pandemic career fair.



Colonel Candice Frost appearing at the ILC Virtual Annual Conference.

ILC Virtual Annual Conference Builds Lean Leaders

Good leadership should be purposely developed in yourself and others by building strong relationships with those on your team, an Iowa-born U.S. Army colonel told more than 200 Iowa business leaders in October.

Col. Candice Frost was the keynote speaker for October's first-ever Annual Virtual Conference by the Iowa Lean Consortium (ILC). The event, customarily the largest single educational event put on by CIRAS, was held online for the first time in 2020 due to COVID-19.

In addition to Frost, the conference included six breakout sessions covering, among other things, how the Omaha Public Power District used Lean to create a strong problem-solving culture and a video summary of continuous improvement projects completed by Cardinal Glass.

Involving frontline workers in problem-solving sessions propelled success, said Brian Kramer, a substation manager for the power district. "We would take that quick win, and we would implement it instantly," he said. "Those quick wins were really important."

Col. Frost, originally from Muscatine, currently serves as director of foreign intelligence for the Army G-2 within U.S. Army headquarters. Speaking from Washington, D.C., she called on Iowans to work at building leadership skills and encouraging the trait in others.

"Each of you has the opportunity to grow this skill," she said. "Leaders are made, not born. No one comes out of the womb a chief executive or a colonel in the U.S. Army.

What matters is that you provide purpose, direction, and, most importantly, motivation for others."

Good bosses know their people and what they're able to do, she said—meaning they know how to put each person in a position to succeed.

Frost acknowledged that some managers are required by circumstance to be "transactional" leaders, always focused on maintaining the status quo and doing what's necessary to keep their team in line. But she urged her audience, when possible, to "shift your mindset from a bureaucratic checklist to become a broader leader. Those are the bosses you forever treasure, because they saw something in you that you didn't see in yourself."

Frost urged listeners to mentor others and seek out mentors themselves—even during "adverse times." Find a mentor now, she said, and "you'll truly demonstrate commitment to your craft."

The ILC began offering a mentor-matching service for its members at the end of 2019. ILC program director Tracy Schuster said the mentoring process recently was simplified through the ILC's own Plan, Do, Check, Act process. Would-be mentees now can search a database and contact a potential mentor directly to inquire about the possibility of working together.

For more, contact Tracy Schuster at tschust@iastate.edu or 515-715-0164.

(For conference recordings, visit the Members Only area of www.ciras.iastate.edu/iowalean.)

UEA Finds Success through Proposal Process

A Waverly manufacturer of slip rings landed a \$1.7 million contract from the Federal Aviation Administration after CIRAS helped the company understand government bidding requirements and learn how to write a formal proposal.

Hemen Dattani, sales director for United Equipment Accessories (UEA), was tasked last March to explore federal contracting opportunities so UEA could leverage a newly forged research and development partnership to expand design capabilities and make the company competitive in new markets. He turned to the CIRAS Procurement Technical Assistance Center (PTAC) for help.

CIRAS government contracting specialist Melissa Burant worked with Dattani for weeks helping him learn how to interpret the government's requirements. The nature of the project meant that UEA had to do more than simply provide a product—the company would need to write a proposal explaining how it would meet the FAA's needs.

With Burant's help, Dattani found a proposal-writing class. He then worked a week of 15-hour days to write and submit UEA's proposal.

Burant described the collaboration as a perfect example of how companies can make the most of PTAC assistance.

"The greatest difference I have observed between those companies who see success versus those who don't is that successful companies tend to work with us side by side and understand the importance of tapping into PTAC as a resource," she said. "We may not always have the answers, but we're a great guiding light to show you the way."

Dattani praised PTAC's expert counsel.

"This is selling by writing," Dattani said. "It's very different in many ways, and totally new for us. Melissa was very instrumental in guiding me through each step of the way."

For more information, contact Melissa Burant at mmburant@iastate.edu or 563-726-9958.

The United Equipment Accessories Team.

AT A GLANCE

United Equipment Accessories

FOUNDED: 1952

OVERVIEW: Family-owned company specializing in a wide variety of rotary motion products.

EMPLOYEES: 145

IMPACT: A new contract worth \$1.7 million.

FOR MORE: www.uea-inc.com

FOR THE RECORD

Key pillars of the CIRAS support structure continue to be reinforced by federal agencies so CIRAS can maintain access to its vast network of expertise.

CIRAS received its annual award from the National Institute for Standards and Technology (NIST) Manufacturing Extension Partnership (MEP). As part of a long-term agreement, \$2.1 million of federal money is matched with CIRAS funds to create an MEP program budget of \$4.2 million. In addition, as part of the Coronavirus Aid, Relief, and Economic Security (CARES) Act, CIRAS received \$595,000 to help small and medium-sized manufacturers respond to COVID-19. During 2020, CIRAS also won competitive awards in the amount of \$200,000 to increase the adoption of Industry 4.0 technologies and \$53,000 to create a regional service center supporting the MEP National Network in food manufacturing.

The U.S. Defense Logistics Agency recently renewed CIRAS as Iowa's Procurement Technical Assistance Center (PTAC). CIRAS will receive roughly \$700,000 during the next fiscal year. The money is matched with CIRAS funds to provide nearly \$1.2 million of assistance to Iowa businesses in navigating the world of government contracting.

CIRAS last year received \$1.4 million through the Iowa Legislature's Economic Development Appropriations Bill to fund our Technology Assistance Program (TAP), which provides expertise and funding to businesses to lessen the risk of adopting new technologies.

Finally, CIRAS has received another \$138,000 installment of a grant from the federal Economic Development Administration (EDA) to assist rural communities in their search for skilled workers. The initiative, known as the Iowa Workforce Innovation Network (iWin), is matched with CIRAS funds and other grants for a program budget of \$276,000. Additionally, the CARES Act is providing another \$150,000 in FY2021 for workforce-related programs to assist with pandemic recovery.



AT A GLANCE

Premier Real Estate Services

FOUNDED: 2010

EMPLOYEES: 6

OVERVIEW: A full array of real estate services for investors, owners, and tenants.

IMPACT: Delayed costly purchase of a new elevator cab.

LEARN MORE: www.premier-midwest.com

Mix of Ancient, Advanced Technologies Salvage Older Elevator

A downtown Des Moines apartment building avoided a costly elevator replacement last year after CIRAS helped its owners recreate an essential piece of safety equipment.

Investors bought the aging, 11-story building at 600 East Fifth Street in Des Moines in 2013. They then renamed it The Lyon and spent two years remodeling it into 103 new apartments. A problem soon became apparent, however, in that something important seemed to have been lost during the sale.

An account manager with The Lyon's elevator maintenance company estimated that equipment there dates back "at least 50 years"—to a time when elevator shafts were built with key-controlled "safeties" located roughly at each floor to catch the car in case a cable broke. Once engaged, whether via accident or test, those safeties could only be reset by turning a key in a slot in the elevator car floor.

A key that The Lyon no longer had.

"The cab is original to the building, and they no longer manufacture that model," said Brittany Jackson, an account manager with Premier Real Estate Services. Borrowing a key soon became untenable, so "we looked online. We looked on eBay. Nothing. Recreating one was the only option."

Premier contacted CIRAS for help, but physical limitations blocked the first attempt to create a 3D scan of the keyhole. So experts reverted to much older technology: they stuffed modeling clay into the mechanism, then scanned the removed clay and used it to create a 3D design.

Chris Hill, director of the CIRAS Technology Assistance Program (TAP), then worked with CIRAS project manager Jake Behrens to clean up the computerized design and 3D print a plastic prototype. After a few modifications, CIRAS used its metal 3D printer to create a new permanent key.

"This just shows that these technologies are not just for manufacturers," Hill said, arguing that many technologies found in Iowa State University's Digital Manufacturing Lab powered by Alliant Energy also could prove helpful in other ways, such as when builders seek to recreate old architectural features. "There are a lot of other areas where they can be put to use."

For Jackson, the project was a lifesaver.

"Without this option, I'm not quite sure where the owners of our building would be," she said. "We got severely lucky in finding CIRAS."

➤ **For more information, contact Chris Hill at chhill@iastate.edu or 515-313-8251.**



Lyon on-site building manager Cody Hiles turns the key in front of a mural inside an elevator. Smaller photos show the keyhole, a clay molding used for scanning (top left), and two plastic prototypes.

Persistent Bidding Helps Bowe Machine Break into Government Contracting

A Bettendorf machine shop landed government contracts worth more than \$100,000 after CIRAS helped a new supervisor delve deep into the intricacies of government bidding.

Michael Bigsby had been working at Bowe Machine Company for roughly six months when he proposed that the company pursue government contracts. Bigsby had been involved in quoting government jobs for a previous employer, but he had never played a major role in the bidding process.

So, he sought help understanding the procedures.

Melissa Burant, a government contracting specialist with the CIRAS Procurement Technical Assistance Center (PTAC), worked closely with Bigsby for several months to get Bowe registered with government agencies and certified to see sensitive information. She helped him get set up with CIRAS BidMatch, a computer system that sorts government bidding opportunities based on user-defined criteria, and continued tweaking the settings until Bigsby's daily email load was manageable.

The two kept talking over several months as Bigsby bid roughly 50 to 60 jobs without ever receiving a contract. Eventually, perseverance paid off in several jobs producing welding fixtures for military machine shops.

"It seemed like once we got our name out there and we won one, then I started getting phone calls," Bigsby said.

"He kept showing up," Burant said. "He didn't let up on the gas after our first conversation. He put it into practice, and he has continued to invest in the process."

Burant praised the company's determination, and Bowe praised Burant's quality advice.

"Melissa has been a great help," Bigsby said. "Anytime I have a question about whether I'm doing something right, I call her."

➤ **For more information, contact Melissa Burant at mmburant@iastate.edu or 563-726-9958.**

AT A GLANCE

Bowe Machine Co.

FOUNDED: 1956

OVERVIEW: Family-owned job and contract machine shop.

EMPLOYEES: 70

IMPACT: More than \$100,000.

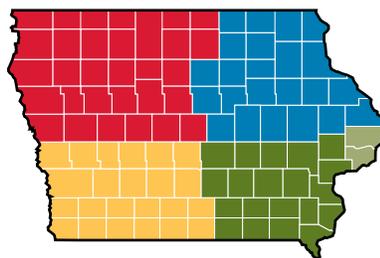
FOR MORE:
www.bowemachine.com

CIRAS Engage. Educate. Embed.

Since 1963, we have delivered proven services to enhance the performance of industry. Our approach—Engage. Educate. Embed.—creates specific solutions that allow each business and its community to prosper and grow. Coupled with a satisfaction guarantee, our typical client has achieved a 200% ROI. Clients have reported an economic impact of more than \$2.8 billion over the past five years.

Locate your county to find your best introduction to CIRAS.

In addition to four regional account managers, CIRAS has six regional government contracting specialists,* a statewide account manager for the food industry, and one for economic development. More staff information can be found at www.ciras.iastate.edu/staff.asp.



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GROWING YOUR BUSINESS

Digital Manufacturing Lab: A Smart Resource for Iowa Manufacturers

By Abhay Grover

The manufacturing world has changed. Isolated mechanical systems are being replaced by real-time, interconnected, and self-operating systems that share data among themselves. This is the fourth industrial revolution and the future of operational efficiency. Is your manufacturing operation ready?

CIRAS, working closely with our technology partners, is working hard to get you there.

In September 2019, we opened Iowa State University's Digital Manufacturing Lab powered by Alliant Energy. The lab helps companies experience, identify, and implement cutting-edge Industry 4.0 manufacturing technologies. We help businesses succeed by solving business problems and making sure they have a plan that supports technology beyond the initial implementation.

CIRAS helps companies explore new technologies through educational events, webinars, and on-site demonstrations. We work with our Digital Lab technology partners to help companies understand areas where technologies can provide new solutions to old problems. We help companies test the possibilities, then we connect them with providers and support any

purchasing decisions. We also can assist proof-of-concept development and help with implementation.

Our partnerships with technology leaders around the state help CIRAS give our clients access to the latest technology resources. Currently, our lab houses state-of-the-art 3D printers, metrology-grade laser scanners, robots, sensors, vision systems, and more. We work continually to develop new and pertinent demonstration units to explain what the technology can do—always guided by the direct feedback we get from Iowa manufacturers. Recent technology additions include contact tracing and density mapping sensors.

If you're not sure where to start, CIRAS has a robust Industry 4.0 technology assessment process to help companies identify and prioritize potential needs. This covers areas such as cybersecurity, augmented and virtual reality, big data analytics, robotics, industrial automation, system integration, Internet of things, and 3D printing.

Industry 4.0 is here to stay, and new technologies can solve real business problems in new ways. CIRAS can help you find those solutions with a minimum of risk.

For more information, contact Abhay Grover at agrover@iastate.edu or 515-509-1485.