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MANITOBA AEROSPACE WEEK

MAY 26-30, 2014

LOOKING TO THE FUTURE

MANITOBA AEROSPACE

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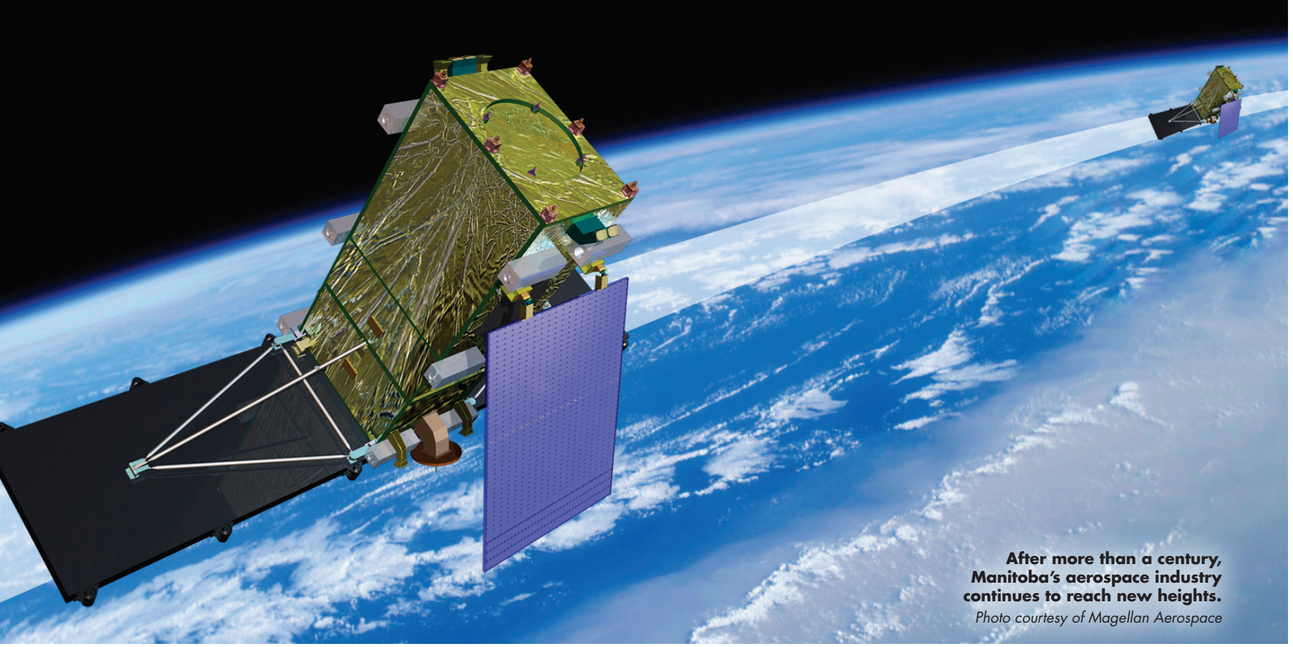
Winnipeg Free Press



After more than a century, Manitoba's aerospace industry continues to reach new heights.
Photo courtesy of Magellan Aerospace

AEROSPACE INDUSTRY IS STILL UPWARDLY MOBILE IN MANITOBA

For the Free Press

Our aerospace heritage is a source of pride for Manitobans.

From modest roots, the industry has grown over more than a century to become the third largest aerospace centre in Canada — which itself is fifth in the world. That makes us a big fish in a big pond, and our aerospace trailblazers continue to soar.

"It's one of the key industries in Manitoba. It's over 5,000 jobs and over $1.5 billion annually — and 80% of that is exported," says Manitoba Aerospace Association executive director Ken Webb.

Ken Webb

Pioneering Spirit

The seeds of the industry were planted in 1911, when Standard Machine Works opened as a small automotive repair shop. Today StandardAero is one of Manitoba's big-three aerospace companies with Boeing and Magellan Aerospace.

"The MacDonald Bros. Sheet Metal and Roofing Company started as a construction company back in 1914, became MacDonald Bros. Aircraft in 1930, which turned into Bristol Aerospace, which turned into Magellan Aerospace. In 1962, the company took Manitoba into space with the development of rocket motors and the Black Brant rocket," Webb says.

"Trans-Canada Air Lines brought commercial aviation to the province when it started up in 1936. That company moved its headquarters to Montreal and is now known as Air Canada."

During the Second World War, air crews and pilots were trained at 14 Manitoba air bases under the British Commonwealth Air Training Plan, which gave Manitoba the legacy of the Southport and Gimli air bases.

And in 1971 Boeing opened a plant with 57 employees in Winnipeg. It now employs 1,600 people at two local sites and it's the largest composites manufacturing plant in Canada, producing parts and assemblies for Boeing aircraft including the 787 Dreamliner.

The Legacy Continues

In 2003, the non-profit Composites Innovation Centre was established to further develop the composites industry in Western Canada. Aerospace research and development projects include seeking ways to reduce fuel costs and emissions with lighter, more efficient aircraft.

Manitoba is also a leader in engine testing. In 2010, Pratt & Whitney Canada and Rolls-Royce Canada partnered to establish the Global Aerospace Centre for Icing and Environmental Research (GLACIER) in Thompson, and in 2011, GE and StandardAero created a test centre in Winnipeg.

"Between Pratt & Whitney, GE Aviation and Rolls-Royce, they provide 80% of the world's aircraft engines, and all those engines now have to come to Manitoba for testing," Webb says.

A Skilled Workforce

The industry is powered by people, and companies of all sizes are intensely committed to developing a skilled workforce that's engaged in the workplace and in the community.

Boeing, Magellan Aerospace and StandardAero are all among Manitoba's Top 25 Employers, and they help smaller companies grow and develop to meet international qualifications through the Competitive Edge program. The industry-led Manitoba Aerospace Human Resources Council (MAHRC) identifies training requirements and works closely with educational institutions such as the University of Manitoba, Red River College and Neeginan College.

The industry actively encourages youth to pursue careers in aerospace, and it supports students through initiatives such as the Aerospace Student Awards Endowment Fund.

Collaboration & Co-operation

Webb says Manitoba's aerospace companies collaborate more than they compete, and the ability to work together with other companies, academic institutions, governments, research organizations and economic development agencies is recognized nationally and internationally as one of our key strengths.

"We're big enough to have all the things that a global company needs, and we're small enough to have them within a phone call or an arm's reach away."

The Path Ahead

A developing middle class in countries such as China and India is driving growth in the aerospace industry. More people want to fly and that means more aircraft are needed. But there are also new challenges as global competition heats up.

Staying at the top of our game requires continued innovation and investment in research, technology and the workforce. Manitoba's expertise will be key in a national supply chain development program similar to Competitive Edge as well as the new Consortium of Applied Research and Innovation in Aerospace in Canada.

And provincial industry leaders have developed the Technology Road Map, creating an action plan for the future to ensure the industry is as dynamic 20 years from now as it is today.

It all adds up to great career opportunities in a growing industry.

MANITOBA AEROSPACE ASSOCIATION MEMBERSHIP 2014:

COMPANIES:

- Boeing Canada
- Magellan Aerospace Winnipeg
- StandardAero
- EMTEQ
- Advanced Composites Structures
- Aero Recip
- Allied Wings
- Argus Industries
- Cadorath Aerospace
- Capitol Steel
- Carlson Engineered Composites
- Cormer Group
- Dynamic Machine
- Enduron
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- Flightcraft Maintenance
- Keewatin Air
- Micropilot
- Standard Manufacturers

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- Canadian Light Source
- CME
- Composites Innovation Centre
- Deloitte
- Economic Dev Wpg
- EnviroTREC
- GE Capital
- Hilton Suites Hotel
- HindTech
- Iders
- Industrial Technology Centre
- Investors Group - Tom Aldridge
- MDS AeroTest
- Pointman Canada Ltd
- Province of MB
- Red River College
- Southport
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MESSAGE FROM THE PRESIDENT

Kevin Bartelson

"Every day, millions of people are sent around the globe in the products or by the services we provide. They visit, work in, and travel to new countries. They meet new people. They make new connections that are meaningful, valuable, and reciprocal. I like to think that we're working toward world peace."

WFP

SCAN PAGE TO SEE BONUS CONTENT

Collaboration and relationship building is at the heart of the Manitoba Aerospace Association. Manitoba's highly competitive aerospace industry delivers quality products to customers on six continents.

I like to think that we in the aerospace industry are working to help bring about world peace. Every day, millions of people are sent around the globe in the products or by the services we provide. They visit, work in, and travel to new countries. They meet new people. They make new connections that are meaningful, valuable, and reciprocal. I like to think that we're working toward world peace.

The more people get to know each other, the more likely they are to get along.

The Manitoba Aerospace Association exists for the same reason. It brings companies together and facilitates collaboration so that we can continue to improve as an industry.

In this spirit of collaboration, I'd like to welcome four new association members, Pointman, Iders, Capitol Steel and MDSAeroTest. Our association is growing, as is our industry.

The strength of Manitoba aerospace was evident at the Western Expo we hosted here in Winnipeg. People from across the country came to learn about industry trends, connect with one another, and hear speakers from both academia and industry.

A Royal Audience

Last week, Prime Minister Stephen Harper visited our Aerospace and Aviation in Manitoba (AAIM) Day celebrations. The prime minister has shown interest in our industry, and for good reason. Passenger air travel and the demand for new commercial aircraft continue to increase.

We also had the privilege of welcoming Prince Charles and Camilla, the Duchess of Cornwall as they visited AAIM Day. While these visits are an honour in themselves, they've also generated some national interest in what we do. The country will be looking to Manitoba as a leader in aerospace.

A Top-Five Aerospace Nation

Our province is home to a supportive business environment; an award-winning culture of university, college, and high school engagement; and a Network-of-Excellence headed by the Manitoba Aerospace Association.

Last year the Jenkins report and Emerson review were commissioned by the federal government to understand how Canada could maintain its position as a top-five aerospace nation. That drove a lot of activity for all of Canada, but was particularly engaging for Manitoba. We've been invited to participate in the building of reports, studies, recommendations and new programming.

While we're still working to identify where we need to be on the technology road map established last year, I'm happy to see people from Winnipeg participating in those discussions and helping to create a plan for industry development.

Informing Our Members

The new Manitoba Aerospace Association website launches Monday, May 26. The informative and impressive new website provides an opportunity for us to communicate with, and demonstrate our value to, the rest of the world. It also provides us an opportunity to connect with the new generation of aerospace engineers and technicians. Visit us at www.mbaerospace.ca.

Investing in the Future

In order to ensure the industry's success in the future, we have to give young people a reason to believe in what we do. The Manitoba Aerospace Association is partnering with Red River College and the University of Manitoba to create a student endowment fund. Connecting with young, bright minds is an investment in the future leaders of Manitoba aerospace.

With continued collaboration across industry, academia, research organizations, and governments, we can work toward the innovation and quality production that will ensure the future success of the aerospace industry in Manitoba.

Kevin Bartelson, General Manager
Boeing Canada Winnipeg
President, Manitoba
Aerospace Association

ROAD MAP PROVIDES DIRECTION FOR FUTURE

For the Free Press

There are challenges on the horizon, but Manitoba's Technology Road Map is designed to keep the aerospace industry on a prosperous path well into the future.

Kim Olson, senior vice-president of StandardAero, chaired a committee of 15 industry leaders that was formed to study recommendations made in the 2012 Emerson report.

"The Emerson report gave us a national feel for where the aerospace industry was at, its challenges and where we want to go," Olson says. "We took a look at the report's recommendations and organized a committee to discuss what we could do at the provincial level to ensure our future competitiveness. We have never done this locally before."

The result is the Manitoba Aerospace Technology Road Map (TRM), a strategic plan to build on the industry's strengths and provide focus for technology development.

More than 50 technical experts from across the province participated in Thrust Area Working Groups to consider needs and opportunities in six major technology areas:

- Advanced Machining: Key technologies include high-speed machining, 3D scanning, non-destructive evaluation and nanotechnology.
- Robotics and Automation: Focus areas are robotic assembly, robotic finishing and the integration of vision systems.
- Composites: Key technology areas are out-of-autoclave processing, high-temperature composites, resin infusion, 3D fibre pre-forms and automated lamination.
- Simulation Modelling and Analysis: This area relates to education and training, with a focus on development areas such as enhanced technical instruction and analysis (including virtual reality training), simulation platform for complex interconnected systems and modelling of new and emerging composite materials.
- Testing and Certification: This area calls for development of a gas turbine testing simulator to facilitate training for test technicians and engineers.
- Space and Rocket Systems: This thrust area involves research and development related to space travel and satellites.

Kim Olson

Olson says the TRM is now in the communication phase to inform industry colleagues, inspire collaboration and attract funding for the technology development priorities it established.

"The report gives us a calling card to say what our interests are and the areas in which we are interested in engaging in collaborative development."

Manitoba Aerospace Association

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The Honourable Michelle Rempel, Minister of State for Western Economic Diversification

GREETINGS

The Honourable Michelle Rempel
Minister of State for Western Economic Diversification

On behalf of the Harper Government, I am pleased to extend greetings during Aerospace Week in Manitoba.

The western Canadian aerospace industry is a competitive, vibrant and growing sector that supports the employment of approximately 27,000 people and generates more than $4.5 billion in annual revenues.

Across Western Canada, our entrepreneurs are driving new economic opportunities through innovation. As home to the largest aerospace sector in Western Canada and the third largest provider of aerospace goods and services in Canada, Manitoba is a leader in this thriving sector.

I am proud of our government's support to enhance aerospace innovation and training. In particular, my department of Western Economic Diversification Canada's (WD) assistance to small- and medium-sized businesses in accessing Industrial and Technological Benefit opportunities. We are diligently seeking to position western Canadian companies as suppliers of choice, connecting businesses with lead manufacturers and contractors on federal procurements.

I look forward to our continued collaboration to strengthen the aerospace sector in Manitoba and across the West. Together, we are showing the world that the West Means Business.

SALUTATIONS

L'honorable Michelle Rempel
Ministre d'État chargée de la Diversification de l'économie de l'Ouest canadien

J'ai le plaisir de vous saluer au nom du gouvernement Harper à l'occasion de la Semaine de l'aérospatiale au Manitoba.

L'industrie aérospatiale de l'Ouest canadien est un secteur concurrentiel et dynamique en plein essor qui emploie près de 27 000 personnes et génère plus de 4,5 milliards de dollars de revenus annuels.

Dans l'ensemble de l'Ouest, nos entrepreneurs produisent de nouvelles possibilités d'affaires grâce à l'innovation. En tant que foyer du secteur aérospatial le plus important dans l'Ouest canadien, de même que le troisième fournisseur en importance de produits et services aérospatiaux au Canada, le Manitoba est un chef de file dans ce secteur prospère.

Je suis fière des efforts de notre gouvernement pour améliorer l'innovation et la formation dans le domaine de l'aérospatiale, et, plus particulièrement, du soutien que mon ministère, Diversification de l'économie de l'Ouest Canada (DEO), offre aux petites et moyennes entreprises pour accéder à des possibilités de retombées industrielles et technologiques. Nous nous efforçons de faire des entreprises de l'Ouest canadien des fournisseurs de prédilection, en créant des liens entre les entreprises et les principaux fabricants et entrepreneurs en ce qui a trait aux achats du gouvernement fédéral.

Je compte sur notre collaboration soutenue pour raffermir le secteur aérospatial du Manitoba et de tout de l'Ouest. Ensemble, nous montrons au monde que l'Ouest est en affaires.

AEROSPACE WEEK 2014

On behalf of the Government of Manitoba, it is my pleasure to proclaim Aerospace Week 2014.

Manitoba Aerospace is much more than an organization; it is a community comprised of internationally competitive firms directly employing over 5,000 highly skilled men and women and supported by an extensive infrastructure of suppliers and academic institutions. Manitoba firms continue to compete successfully against the world's most sophisticated aerospace companies both to deliver goods and services around the globe, and to leverage Manitoba's natural strengths to attract international customers to our Province.

While Winnipeg is home to the largest concentration of advanced manufacturing and repair firms, the "big skies" surrounding Portage la Prairie are ideal for military flight training, and our dependable winter climate supports advanced and cold weather testing of the world's newest and largest commercial jet engines in both Thompson and Winnipeg.

I want to express my sincerest appreciation to our Manitoba aerospace community for the significant cultural and economic contribution it makes to our Province, and in particular for the excellent jobs it sustains. The Provincial Government will continue to support the industry and its employees to ensure the continued availability of a skilled and qualified workforce in this Province

Theresa Oswald
Minister of Jobs and the Economy

Theresa Oswald Minister of Jobs and the Economy

Au nom du gouvernement du Manitoba, j'ai le plaisir de proclamer la Semaine de l'aérospatiale 2014.

Manitoba Aerospace est bien plus qu'un organisme. C'est une communauté composée d'entreprises concurrentielles sur le marché international qui emploie directement plus de 5 000 hommes et femmes hautement qualifiés et qui est soutenue par une vaste infrastructure de fournisseurs et d'établissements d'enseignement. Les entreprises du Manitoba continuent de rivaliser avec les entreprises aérospatiales les plus sophistiquées du monde, et ce, pour fournir des biens et des services aux quatre coins du globe et pour maximiser les forces naturelles du Manitoba en vue d'attirer des clients étrangers à notre province.

Winnipeg abrite la plus grande concentration d'entreprises de fabrication de pointe et de réparation. Le vaste ciel de Portage-la-Prairie est idéal pour l'entraînement militaire aérien, et notre climat hivernal, toujours au rendez-vous, facilite les essais avancés et par temps froid des moteurs à réaction commerciaux les plus gros et les plus modernes à Thompson et à Winnipeg.

J'aimerais exprimer ma reconnaissance la plus sincère à la communauté aérospatiale du Manitoba pour ses importantes contributions culturelles et économiques à notre province et, tout particulièrement, pour les emplois excellents qu'elle génère. Le gouvernement du Manitoba continuera d'appuyer l'industrie et ses employés afin que notre province ait toujours accès à une main-d'œuvre compétente et qualifiée.

La ministre de l'Emploi et de l'Économie,
Theresa Oswald

AEROSPACE ALL-STARS

The 12th Annual Manitoba Aerospace All-Stars Awards of Excellence Dinner took place on Nov. 21, 2013. Congratulations to the award recipients:

Award of Excellence for Education and Training

Bill Fraser (Retired) — Chair of Aviation & Aerospace at Red River College - Stevenson Campus

Award of Excellence for Teamwork and Technology Development

Testing, Research and Development Centre, GE/StandardAero/ WestCaRD: Vic Gerden (WestCaRD), Kevin Kanter (GE Aviation), Brent Ostermann (StandardAero), Daniel Verreault, GE Canada

Award of Excellence for Teamwork and Innovation

Boeing 787 Main Landing Gear Door Integrated Material Handling System: Olasunmisi Adegunju, Deepak Bali, Dave Boonstra, Richard Campbell, Anthony Cerasani, Todd Dobson, Christian Fay, Antonio Ferreira, Donald Girard, Kevin Jaworenko, Darryl Kehler, Shawna Kulbaski, Garth Kummen, Patrick Lestition, Darcy Messner, Troy Morin, Andrew Murtomaki, Richard Nakka, Brad Nerbas, Sandra Reich, Renato Santos, Jeremy Solodky, Bryan Sprange, John Stefansson, Mark Winston, John Yestrau

Light footprint: Efficient LED light poles save energy in the new parking lot, while an on-demand compressor system conserves energy in the factory. From left: Adam Marcynuk (Boeing), Ron Marshall (Manitoba Hydro), Venkatesh Shenoy (Boeing), Karrie Zonneveld (Boeing) and Gerry Glor (Boeing).

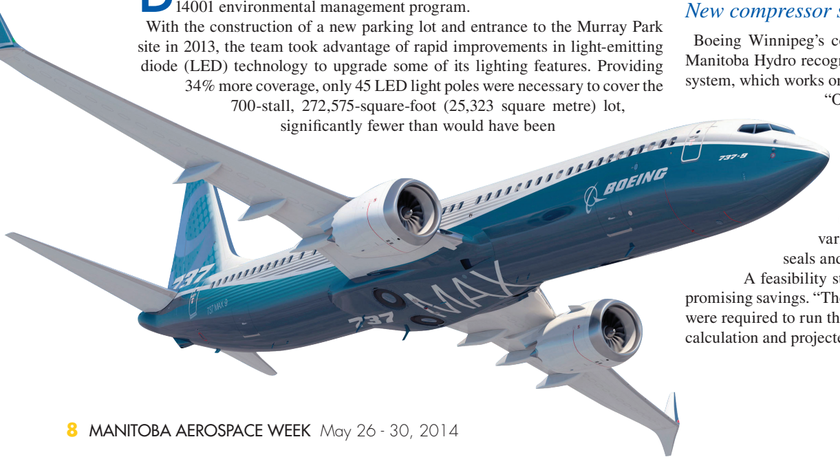
Photos courtesy of Boeing Winnipeg

BOEING IS COMMITTED TO OUR ENVIRONMENT

For the Free Press

Boeing Winnipeg is committed to reducing its impact on the environment. The company conforms to the International Standards Organization (ISO) 14001 environmental management program.

With the construction of a new parking lot and entrance to the Murray Park site in 2013, the team took advantage of rapid improvements in light-emitting diode (LED) technology to upgrade some of its lighting features. Providing 34% more coverage, only 45 LED light poles were necessary to cover the 700-stall, 272,575-square-foot (25,323 square metre) lot, significantly fewer than would have been required by traditional lighting options. Lower maintenance costs, longer life and superior energy efficiency all translate into lower energy requirements as well as costs. Additionally, the project qualified for rebates from Manitoba Hydro for every one kilo-watt reduction.



New compressor system saves energy

Boeing Winnipeg's compressor system is going strong almost a year after Manitoba Hydro recognized the site with a rebate for energy efficiencies. The system, which works on demand, went into operation last summer.

"On demand means that the compressors don't run all the time, regardless of whether anyone is using an air-hose on the factory floor," says Venkat Shenoy, Facilities project manager. "This runs, for example on the weekend, there are only a few departments working so it would not run the four compressors — it would only run one compressor." Compressed air is used for a variety of airplane part manufacturing including vacuum seals and mechanical tools.

A feasibility study done before the new system was installed showed promising savings. "They found that about four million kilowatt hours of energy were required to run the old compressed air system," says Venkat. "They did a calculation and projected there could be about $235,000 energy savings."

MAGELLAN'S STAR CONTINUES TO RISE

For the Free Press

For more than 80 years, Magellan Aerospace has been moving in one direction — up. And two new lucrative contracts, to manufacture horizontal tail assemblies for F-35 aircraft and three new satellite buses, promise to propel the company to new heights.

Magellan Aerospace, Winnipeg vice-president and general manager Don Boitson says the F-35 work required upgrades in technology, equipment and skills that will serve this Manitoba-based business well in the future.

"We had a very skilled workforce to start with, but we've taken them up another level with training, and can utilize these new skills to support other new ventures," he says. "We are going to leverage the new skill sets we have and the new technology into new potential contracts."

Last year, Magellan was awarded a contract from MacDonald, Dettwiler and Associates Ltd. (MDA) to manufacture the RADARSAT Constellation Mission (RCM) satellite buses. That was good news for Magellan's business locally.

"We announced the RADARSAT Constellation Mission as $110 million over four years, and the F-35 program is approaching $2 billion, much of which will be generated in the Winnipeg plant," he says.

In February, the first Magellan-manufactured horizontal tail assembly installed on an F-35A Lightning II aircraft was successfully flown for the first time. The tail assembly was delivered in December 2012, and Magellan is expected to produce 1,000 tail assemblies over the next 20 to 30 years.

In the meantime, the Winnipeg facility will deliver the RCM satellite buses — the satellite infrastructure as well as the payload, including control systems, on-board computers, electronics and on-board communications links with the ground. All three satellites will be completed by 2018 and will support Canadian maritime surveillance and environmental monitoring.

It's been an impressive journey for a company that was founded as MacDonald Brothers Sheet Metal in 1914.

"We're very proud of it. From those humble roots we've been space pioneers as we like to call them," Boitson says.

"There were pioneers in the West originally, and then pioneers in the aircraft (industry) when the bush planes and float planes came into service, which was the MacDonald Brothers' start in aerospace, and then pioneers on the space side with our Black Brant program and now satellites, so it's been a pretty exciting progression for our business."

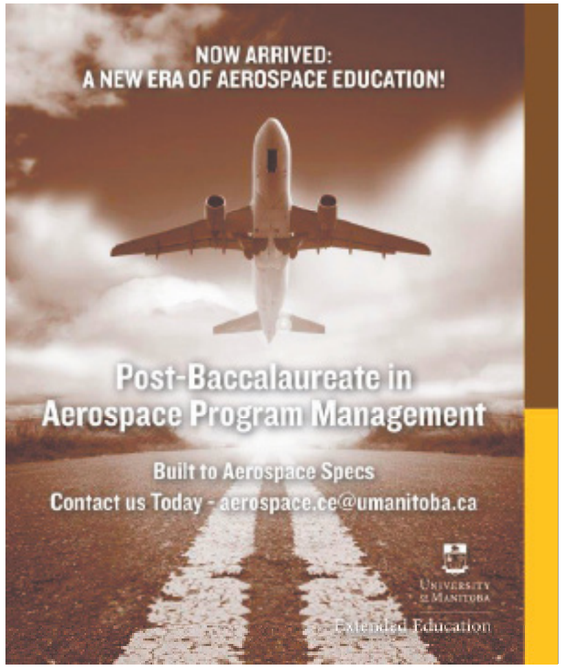
Magellan's first Black Brant rocket was launched in 1962. The company celebrated the 50th anniversary by donating a Black Brant to the Manitoba Museum, but the rockets are still going strong.

"Customers continue to use the Black Brant for scientific and space research. We have over 100 engineers working on the Black Brant, RCM and other programs, so that's a solid part of our business. We also manufacture aeroengine and aerostructure assemblies for most of the major OEMs such as General Electric, Rolls-Royce, and Airbus amongst others."

Magellan is proud of its legacy and is positioned to make more pioneering contributions to Canada's space and aerospace heritage for years to come.

Magellan has landed a contract to manufacture horizontal tail assemblies for F-35 aircraft for the next 20 to 30 years.

Photo courtesy of Magellan Aerospace



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STUDENTS TEST UAV METTLE AT SOUTHPORT

All eyes were on Southport skies when 11 teams of students from universities across the country gathered to test their high-flying creations in the Sixth Unmanned Systems Student UAS Competition May 2-4.

Southport Aerospace Centre hosted the competition, which aims to develop expertise in unmanned systems technologies.

Mathew Henderson, Southport's marketing and business development manager, says most participants are engineering students.

"They have to create and design an unmanned aerial vehicle. Some of them purchased a model airplane and then customized it. Others created their own airframe and then put the electrical components in it," he says.

"They basically have to build the guts. The main idea is to create the thinking part of the airplane. Their goal is to be fully autonomous, so it doesn't have to get any direction from a human being."

First, the teams designed a report about their project. Then they put it to the test in an operational demonstration in Southport, using their UAVs to complete tasks in a mock situation. The students were presented with a fictional scenario in which farmers accused a pipeline owner of polluting the area and affecting their crops. Meanwhile, the pipeline owner suspected illegal activity or encroachment from the farmers.

Using their UAVs, the student teams identified and mapped the percentage of crops affected by the pipeline. They also located a rockslide in the area and calculated its volume. For the pipeline owner, they identified suspicious activities or unauthorized people in the vicinity.

The main challenge is to integrate the expertise of different teammates, Henderson says.

"You might have a mechanical engineer or a structural engineer trying to work on one project, but their functions are completely different. One is trying to get the computers to talk to each other. Meanwhile the other one is trying to make sure that it literally doesn't fall apart," he says.

"You're basically changing the entire structure, weight and balance of the machine. The integration is the most challenging for the students, as well as the automation. The automation is very technical, very advanced and has to be done carefully to be successful."

This year, a University of Toronto team took top place in the design phase, and a Université de Sherbrooke team ranked first in the operational phase. No teams from Manitoba competed in 2014.

Next year's competition is expected to be held in Alma, Que.

Students put UAVs through their paces.
Photo by Fred Greenslade

FUTURE OF UAVS UP IN THE AIR

By Jennifer McFee
For the Free Press

Unmanned aerial vehicle (UAV) mainframes are easy to come by, but the controllers that make them fly require the expertise of rare birds like Manitoba's MicroPilot.

Howard Loewen launched MicroPilot 20 years ago as a side project. He had a personal interest in UAVs and a master's degree in computer science, a combination that helped build a company that now ships high-tech controllers to 65 countries.

Loewen says there are three main UAV airframes: Fixed wings, helicopters and multirotors.

"Each of them has their pros and cons. The fixed wings, which are like your regular airplanes, are hard to get back on the ground. It's tricky, and you can damage them quite a bit in the process," he says. "But they can carry a lot, and they can fly for a long, long time."

Helicopters can fly for about an hour. They're easy to get in the air and back to the ground because they can launch and land vertically. But they're expensive and difficult to build.

"And they're frightening because there are real safety issues with helicopters," Loewen says.

Meanwhile, multirotors are made with multiple propellers attached to a platform.

"They fly by adjusting the speed of the different propellers. They are relatively inexpensive, and they're safer than helicopters. You can get a bad cut with them, but you're not going to lose a limb," he says. "But they can't fly for very long and they can't carry very much."

Regardless of the structure, UAVs are used to collect some sort of information, using a camera, sensor or video to capture and store information or transmit it back to the user in real time.

"There's a little bit of talk about using them to deliver things to remote places, but that's not really the high value," Loewen says.

All UAVs, including expensive models used by the military, are based on parts found in any model airplane. Many companies manufacture UAVs, but MicroPilot is one of only a small number of companies in the world that can give it brains, making the computer and software that make a UAV fly all by itself.

"We make a little computer circuit board with some software that goes inside the UAV and we make the software that goes on your laptop," he says.

"You can use it to tell the UAV where to go, loading the flight path into the circuit board in the plane. The thing will go off, fly around, and come back and land."

Based in Stony Mountain, MicroPilot entered the industry early, and Loewen says it has great potential.

"But there's a big risk that the regulators are going to lose control of the market to the hobby-type operators. That's really quite dangerous because even if a little multirotor drops from 300 feet on someone, it could really hurt them. The future is a little bit cloudy right now, in part because the regulators haven't figured out how they want to regulate them."

He hopes regulators develop a process to separate responsible users from irresponsible ones. And he adds there are safety and privacy concerns that need to be addressed.

"These things are just a little bit too easy to abuse to allow the general public to use them at will," he says.

"One good thing about the aviation industry is that it's very good at co-operating worldwide. So once we have regulations, we will likely have worldwide regulations."

These Interlake School Division students have become passionate about science.
Submitted photos

SPACE PROJECT GETS KIDS HOOKED ON SCIENCE

By Holli Moncrieff
For the Free Press

It's too early to draw conclusions from an experiment that was launched into outer space in January. But it's clear that sending a project to the International Space Station achieved positive results for school kids in the Interlake.

"These kids were not that crazy interested in science previous to being in this program. Now they talk about becoming doctors who fight cancer, curing cancer, or being an astronaut and researcher," says Maria Nickel, a science and technology teacher at Woodlands School and the director of the Student Spaceflight Experiment Program (SSEP) – Interlake.

"It sparked a bit of a revolution in science."

More than 400 students and 17 teachers in the Interlake School Division participated in SSEP. They were the first Canadian participants in the program, and an experiment devised by three students in grades 5 and 6 from Brant-Argyle School was chosen from 1,254 proposals to be sent to the space station. It stayed in orbit for almost nine weeks before it touched down in Kazakhstan on March 10.

The experiment will determine whether green tea, a natural antioxidant, can protect cells from radiation damage.

"We're hoping that the green tea protected the yeast cells we used in the experiment from radiation damage. If it did, green tea could provide protection from radiation here on Earth, and therefore protection from cancer," Nickel says.

Analysis of the experiment has been delayed due to contamination by a bacteria strain that grows much faster than the yeast. It's being treated with antibiotics to kill the bacteria.

"Once we have had a chance to have the antibiotics work we will arrange for the kids to come in and analyze the results."

Two other experiments from students in the division were runners-up. They were devised to find out if royal jelly made by honeybees can slow bone loss in astronauts, and whether algae is viable as a biofuel source.

Nickel, who participated in the Advanced Space Academy for Educators sponsored by Honeywell, says the SSEP project required a lot of work.

"But it's well worth it to see the kids get so excited. When they saw their experiment launch, there were fist bumps, high fives and lots of screaming."

Students were invited to meet Prince Charles and the Duchess of Cornwall during the Royal Tour. And in February, Canadian astronaut Jeremy Hansen visited Woodlands Elementary, where Nickel runs an extracurricular space club.

"We were the Canadian Space Agency's only rural elementary school stop in Manitoba," she says.

In recognition for her ability to get kids excited about science, Nickel received the Prime Minister's National Award for Teaching Excellence last November.

She says participating in SSEP will make her a better teacher. And the kids have learned how science is important in every aspect of our lives.

"Some of our greatest challenges in medicine and the environment will be solved by scientists," Nickel says. "Without science, we wouldn't have our greatest inventions, treatments, and cures."

Astronaut Jeremy Hansen with teacher Maria Nickel.
Submitted photo

PROGRAM BRIDGES GAP FOR ABORIGINAL STUDENTS

By Jennifer McFee
For the Free Press

More Aboriginal students are seeing engineering as a viable career option, thanks to a targeted University of Manitoba program.

Tailored specifically for Aboriginal students, the Engineering Access Program (ENGAP) offers support in four broad areas — academic, personal, social and financial, says director Randy Herrmann.

"To get into engineering right now, you need a minimum of an 85% average in physics, pre-calculus mathematics and chemistry," says Herrmann, who has a Metis background.

"Many of our students, especially those from more rural or isolated communities, don't even have physics or pre-calculus math offered in their school. Maybe they're outstanding math students, but they'll never get into the faculty because they don't have the prerequisites to get in."

ENGAP offers pre-calculus and physics courses to prepare students for their first year of engineering classes. It also provides tutor support, and a personal counsellor helps students deal with transitional issues and other concerns.

"If you've been raised inside the Perimeter, you have an idea of what Winnipeg is. If you were raised in Lac Brochet or Norway House or somewhere in the North, your idea is quite different," Herrmann says.

"Sometimes these students have significant transitional issues moving to Winnipeg. They're coming to a large city like this, not knowing what's expected of them or how the bus system works. We help students with those issues."

Socially, ENGAP aims to create a sense of family through its home-away-from-home atmosphere.

"We have a lounge for them where they can get together," Herrmann says.

"We do potluck lunches. We do ceremonies and suppers so the students feel that this place can substitute in a small way for their home."

On the financial front, the program provides scholarships and bursaries.

"The aerospace sector has been very generous in donating money for that purpose. They certainly have helped us, and I know that students really benefit," Herrmann says.

"Many of our students come from rural communities and some isolated communities. Trying to think about how to come to university is always a financial problem for them. So when you can give them some money in scholarships and bursaries, it really can make a difference."

The results speak for themselves. Next year, ENGAP will mark its 30th anniversary, and see its 100th student graduate from the program — a much higher success rate than any other university in Canada.

First-year student Mitchell Boulette says the program has already broadened his future prospects.

"It's an awesome support. I don't know if I'd be able to do it without ENGAP. It would be a lot more difficult," Mitchell says.

"As for the students, we all help each other. We all encourage each other. We're like a family there. You're not just in it alone throughout your whole academic career. You've got your ENGAP friends, and the students are really supportive of one another."

Mitchell recommends the program to any Aboriginal student who wants to become an engineer.

"ENGAP's there to help you out throughout the process and throughout your academic career."

STANDARDAERO MAINTAINS FAST PACE IN ITS SECOND CENTURY

For the Free Press

StandardAero was chosen as one of Manitoba's Top 25 Employers for the second year in a row. *Submitted photo*

StandardAero is one of the world's largest independent providers of aviation services, including engine and airframe maintenance, repair and overhaul, engine component repair, engineering services and interior completions.

StandardAero serves a diverse array of customers in business and general aviation, airline, military, helicopter, components, energy and VIP completions markets.

The company surpassed $1.7 billion in annual revenues last year. While it celebrated its 100th year of industry leadership in 2011, StandardAero sees a bright future over its next century of service.

During the past year, StandardAero's Winnipeg site continued to receive external recognition for its amazing culture and workforce. In fact, for the second year in a row, the company was selected as one of Manitoba's Top 25 Employers. This award recognizes Manitoba employers that lead their industries in offering exceptional places to work. In addition, StandardAero was recently recognized as one of Canada's Top Employers for Young People — one of only three organizations in Manitoba to achieve such distinction. StandardAero is a company that believes it is the intangibles – such as creating a family atmosphere and a culture of respect and camaraderie – that create a history of long-term employees and an attractive workplace for all generations, past and present.

On the business front, StandardAero continues to demonstrate its aerospace industry leadership. Earlier this year, the company was recognized by Rolls-Royce, receiving its FIRST Network Customer Satisfaction Award. The 2014 award represented the fifth consecutive year that StandardAero has been recognized by Rolls-Royce for outstanding customer satisfaction.

StandardAero has also been actively working to broaden its global customer base. During the first months of this year, the company completed strategic, long-term turbine engine maintenance agreements with China Express Airlines and Japan-based IBEX Airlines. In addition, StandardAero signed a maintenance agreement with Sweden's West Atlantic Cargo Airlines to support the cargo carrier's CF34 engines powering its fleet of CRJ-200 aircraft. StandardAero continues to invest in expanding services to customers around the world.

Looking toward the long-term, StandardAero renewed its 10-year license with Rolls-Royce as the sole independent Authorized Maintenance Center (AMC) in North America to perform repair and overhaul services on engines operated on aircraft flown by the United States Air Force, United States Marine Corps, United States Coast Guard, Royal Australian Air Force and Royal Canadian Air Force. The license allows StandardAero to sustain its tightly OEM-aligned strategy to support global operators from its Winnipeg facility for the next decade.

In partnership with General Electric, StandardAero Winnipeg continues to serve as an independent GE TRUEngine authorized MRO provider for both CF34 and CFM56 engines. GE engines overhauled by StandardAero are eligible for TRUEngine status, a very preferential distinction in the aerospace industry. Since June of last year, StandardAero has completed more than 40 qualified TRUEngine overhauls for North American mainline airline customers and regional airlines customers from around the world.

StandardAero is off to a fast start in 2014 and continuing its efforts to grow the company while recruiting and retaining the best talent on Earth.

GROOMING TOMORROW'S AEROSPACE PROGRAM MANAGERS

A small group of Royal Canadian Air Force officers and one civilian are about to become the first graduates of a unique University of Manitoba program designed to groom the next generation of aerospace leaders.

The Post-baccalaureate in Aerospace Program Management (PAPM) provides a broad foundation for students who may one day manage the entire life cycle of a complex aerospace system, from the concept stage through design and manufacture, marketing and ongoing employment and maintenance.

"We're very excited by the program. It is unique in Canada at the moment in the sense that it is multidisciplinary," says Steve James, executive coordinator of aerospace programs in the Faculty of Graduate Studies.

Courses offered by the faculties of engineering and arts and the I.H. Asper School of Business range from mechanical engineering to business management and even political studies.

The program is geared toward young professionals who have a minimum three-year bachelor degree and who are already working in the industry. These students may be in early middle-management roles now, and PAPM will lay the foundation for them to move into more senior program management positions in the future.

"It is to get them their baseline understanding and of course their awareness so they can accelerate their actual learning on the job," James says.

"We need to give them the tools to understand the multiple factors that are involved in putting an aerospace program together and making it actually happen."

Launched in September, the program was initially delivered to eight officers and one civilian at the Canadian Forces School of Aerospace Studies at 17 Wing. But it's aimed at a much wider base and, eventually, James would like to see about 20 new students each year. Classes will be held in the afternoon and evening to accommodate work schedules and PAPM is looking for a permanent home near the Winnipeg airport.

Historically, program managers tend to rise through company ranks. But increased global competition for aerospace expertise, combined with greater retirement rates among baby boomers, means there's a shrinking number of experts who can do complex system management and integration of aerospace systems. James says Canada needs to increase their ranks to remain competitive.

"We have a shortfall of those kind of people and this program is designed to develop people for those senior and complex management roles."

Dana Sochaski chose an aerospace program in high school to jumpstart her career.
Photo by Darcy Finley

HEAD OF THE CLASS

By Jennifer McFee
For the Free Press

At 23 years old, Dana Sochaski's aerospace career has already taken flight, thanks to a head start at Winnipeg's Technical Vocational High School.

Now a StandardAero employee, Sochaski graduated from Tec Voc in 2009, with a dual diploma in academics and aerospace technologies.

"I thought it would be neat because it was something different than what all the other schools offered. Through the program, I also did work experience at StandardAero, Boeing and Perimeter while I was still in high school," she says.

At first, she planned to be an aerospace engineer, but Sochaski discovered she prefers hands-on work on the shop floor over computer work in an office.

After using scholarships to pay for a year of biochemistry studies at the University of Winnipeg to confirm she was on the right career path, Sochaski landed a spot at StandardAero through the gas turbine repair and overhaul apprenticeship program. She increased her skills when the company sent her to Red River College for several months of additional study.

"They go through a lot of the aerodynamics. They teach you how to take apart an engine and read your manuals," she says. "They get you prepared for working on the shop floor."

She now works in non-destructive testing, performing liquid penetrant inspections.

"It's one of the five areas of non-destructive testing that you can get certified in. They tear apart the engines, and then I'll look at the parts once it's disassembled. I take fluorescent penetrant, which is like the liquid in a glow stick, and then I process the parts through it," she says.

"In the end, you would get a black light and wherever you see the green penetrant, you have to investigate to see if there is a crack."

Not only does Sochaski enjoy her current duties, she's also optimistic about her future with StandardAero.

"I like it because although I just have one certification right now, I can get up to five," she says.

"As I build up my qualifications, it means that I can do more things. I can have more variety in my work."

To help other high school students launch their careers, Sochaski started her own $250 annual scholarship, which she awards each year to a Tec Voc student graduating from the aerospace program.

"One of the criteria for this scholarship is that it's not for the top student. I was very strong academically, but I felt that a lot of people who were not at the top were missing out on scholarships."

For teens interested in aerospace, Sochaski highly recommends the courses at Tec Voc.

"It's good for people who like being critical because a lot of times, you have to be very precise," she says.

"It's a great program, and there are lots of jobs available. It definitely gave me an idea of what sector of the industry I wanted to go into."

RRC SHARES HIGH-TECH RESOURCES

For the Free Press

The establishment of Red River College's (RRC) Technology Access Centre is now almost two years old and the partnership working closely with aerospace organizations has already met with great success.

The Technology Access Centre (TAC) was established to better enable innovation and productivity within aerospace companies in Manitoba.

This is accomplished through access to the college's equipment, expertise, facilities and capability and delivering value through applied research services, training solutions and technical services.

"We hope to help spur innovation locally and across Canada, supporting new technology validation, new processes, materials and products. The centre supports small and medium-sized businesses as well as the large organizations," says Tracey Dyer, director of business development and director of the TAC initiative within the School of Transportation, Aviation, Aerospace & Manufacturing at the college.

"We've had an enormous response from industry, and we've been lucky enough to work on a lot of very interesting and innovative applied research and training projects."

A new website launched in March serves as an industry portal to highlight resources, direct services and information about student programs from which to draw co-op students and future full-time workers.

TAC provides research expertise, customized training and access to the latest technologies, resources and equipment.

"We can provide organizations with access to new emerging technologies and expertise that they wouldn't necessarily have access to otherwise," Dyer says.

"Many companies can't break from production to test a new product or material or process. That's where we can help."

Dyer says every project is different, and TAC will work directly with industry to provide the best solution possible.

"We're always looking for ways to provide value for local industry — whether it is through integration of newer technologies into their production workflow or more effectively using traditional ones. Our areas of focus include: advanced materials and bonding (welding), robotics and automation, and visualization and simulation."

Learn more about the Technology Access Centre online at www.rrc.ca/tac.

The Imaging, Robotics & Automation site is among TAC's main areas of focus.
Photo courtesy of RRC

CENTRES EXPAND TO YEAR-ROUND ENGINE TESTING

By Jennifer McFee
For the Free Press

The sky's the limit when it comes to research possibilities at Manitoba's engine-testing centres.

West Canitest R&D Inc., better known as WestCaRD, together with GE, StandardAero and Western Economic Diversification are introducing new equipment to allow for year-round tests at the GE Aviation Testing Research and Development Centre (TRDC) located at the Winnipeg airport.

WestCaRD CEO Vic Gerden says it was a good winter for icing tests, which are required by certification authorities. Now, WestCaRD's additional equipment will enable year-round testing such as performance tests and ingestion tests.

Various development and certification tests have already taken place on five different models of engines manufactured by GE Aviation. As well, the site is outfitted to conduct tests for birds, hail and sand that can occasionally be ingested through a plane's engine during a flight.

"These engines need to operate in all sorts of environments. Sometimes there are birds near airports that are inadvertently ingested through an aircraft engine, and the aircraft needs to continue to operate safely. If there is any damage caused, that needs to be contained within the engine covering so that there is no major outcome from that bird ingestion," Gerden says.

"These tests that are done on the ground are to certify that an engine can take a bird strike and continue to operate or at least not fail in any hazardous way."

As a not-for-profit organization, WestCaRD aims to bolster Manitoba's economy through technology growth.

"We do that by augmenting the facility with some of this new equipment to facilitate year-round testing and maximize the utilization of the GE TRDC facility," Gerden says.

"We also help with arrangements to train the specialized workforce needed to conduct the advanced technology testing at this test centre. Plus we facilitate research and development projects that will assist in the smooth operation of the test facilities and bring in more new technologies to Manitoba."

The Global Aerospace Centre for Icing and Environmental Research (GLACIER) in Thompson has also been upgraded to allow for new tests.

GLACIER opened its doors in 2010 as a joint venture between Rolls-Royce Canada and Pratt & Whitney Canada. It also established a not-for-profit organization called EnviroTrec to interact with the research and development community.

EnviroTrec executive director David Simpson says the recent upgrade will allow GLACIER to perform a number of other tests, including endurance testing.

"This is where the engine is made to think it's operating on an airplane for an extended period of time simulating operations such as take-off and landing, climbs and cruise. It makes sure that all the engine systems work individually and together, not only for the short test periods but also for a longer life. It's an important part of engine certification and safety," Simpson says.

"The other thing that's brand new is the ability to do reverse-thrust testing. Sometimes when you're landing in an airplane, you'll hear the engine roar just after you land. What is happening is the engines are, in essence, being used to slow down the airplane. We have the ability now to do that kind of testing on new and developmental engines, which is unique."

This summer, GLACIER will begin conducting tests to evaluate environmental performance.

"There is quite a sophisticated array of equipment set up to measure the content of the exhaust," he says. "It's a series of chemical tests to optimize the reduced carbon emissions and everything else in the engine."

The fundamental purpose of these tests is twofold.

"First, the regulatory environment will demand new engines demonstrate their performance under some fairly adverse conditions," Simpson says.

"On the other side of it, the manufacturers are developing new engines all the time, and some of the tests may evaluate new concepts or designs."

COMPETITIVE EDGE COMES FULL CIRCLE

For the Free Press

The expression "what goes around comes around" certainly applies in the case of Competitive Edge Strategic Development (CESD) Services, a wholly owned subsidiary of the Manitoba Aerospace Human Resources Council (MAHRC).

Over the past three years, CESD Services collaborated with DNAagile Ltd., UK, which helps U.K. companies keep pace in the competitive aerospace and defence industry. The intention was to transfer that knowledge to Manitoba.

"We learned how leading companies in the U.K. develop and deploy robust methods of strategic planning and deployment, problem solving, and continuous improvement when those systems were put in place at Manitoba small to medium sized enterprises," says Wendell Wiebe, executive director of MAHRC.

"These systems and improvements have made a significant impact on the companies that have participated in the Competitive Edge Program. We've seen some stellar results."

At the end of last year, the circle came around.

"Our resources based in Manitoba were asked to transfer this knowledge back to a U.K. organization. We did, with great success," reports Wiebe.

Over several visits in 2013 and 2014, John Kliewer, a CESD Services organization development specialist, spent nearly four months assisting Gardner Aerospace, a major Tier 1 manufacturer for the aerospace and defence industry in the U.K. As one of the top 100 global aerospace and defence organizations, Gardner employs more than 1,500 people in 12 factories located in four countries.

"Gardner was already a great organization. Their challenge was: Could they become better?" says Kliewer.

The Gardner management team identified day-to-day operational problems that prevented them from progressing in their overall strategy. They realized they had to gain control and accountability for their performance to continue to operate at a world-class level.

Kliewer says the approach was to develop a self-sustaining, world-class business plan deployment capability. It was his job to implement this at Gardner. The challenge was to ensure the knowledge transfer was extremely effective so it could be a self-sufficient, sustainable system for the future.

"Although I would only be a phone call away for questions, the geographic distance between the two countries meant total understanding of how these systems worked and how they impact the organization was needed."

Gardner was very pleased with the Manitoba support.

"It helped us focus the management team on key measures of performance and the need to rapidly solve day-to-day problems," says Karl Lee, managing director of Gardner Aerospace's plant in Hull, U.K.

There was more appreciation from the Gardner Aerospace plant in Derby, U.K. John Rooney, director of operations, had high praise for Kliewer's work, saying, "His ability to train, coach and support team leaders and managers during the implementation ensured it was quick, robust, and continues to deliver sustainable results."

Gardner Aerospace now has a system to unlock its potential. For CESD Services, the focus continues to be on supporting Canadian organizations in their journey to world class.

"CESD Services stands for Competitive Edge Strategic Development," summarizes Wendell Wiebe. "We strive to give companies solutions that help them develop strategically."

mds AeroTest

GLACIER pioneered gas turbine icing certification testing in Manitoba in 2010. Today GLACIER is one of the world's most advanced icing cloud simulation systems. Through on-going investments in the facility, GLACIER will continue to be a world leader in the icing certification field. We are proudly located in Thompson, Manitoba whose unique weather conditions provide unequaled cold weather test and evaluation opportunities.

MDS AeroTest operates the GLACIER facility on behalf of Rolls-Royce and Pratt & Whitney. Through its many partners, including EnviroTREC and NRC, MDS AeroTest is committed to supporting Research & Development programs that promote the growth of aerospace in Manitoba.

The Global Aerospace Centre for Icing and Environmental Research (GLACIER) is a joint venture between Rolls-Royce and Pratt & Whitney and in partnership with EnviroTREC, the National Research Council of Canada (NRC), and MDS Aero Support.

www.mdsaerotest.com

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At Boeing Winnipeg, we're proud to be the largest composite manufacturer in Canada and a leading-edge, tier-one supplier to the revolutionary 787 Dreamliner. We're equally proud to be a top employer and vital member of the greater Manitoba community, celebrating more than 40 years of building innovation and opportunity across Canada.

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