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CANADIAN INDUSTRY ONLINE

Credit: Lockheed Martin

LOCKHEED MARTIN

Canada's Trusted Industry Partner for over 75 Years

LOCKHEED MARTIN CANADA: OPENING DOORS TO OPPORTUNITY AND INNOVATION

HEADQUARTERED IN CANADA'S capital is a company with more innovation and technology behind it than most companies will develop in a lifetime. But what's more, Lockheed Martin Canada, led by Chief Executive Charles Bouchard, exemplifies an enterprise with the strength and tenacity needed to not only be a leader in security and aerospace but also in community commitment. The Canadian arm of Lockheed Martin Corporation—which employs almost 100,000 people world-wide—Lockheed Martin Canada has an incredible impact on the Canadian economy, people, and future of the nation's defence capabilities.

The Lockheed Martin Aircraft Company set up operations in Canada close to 80 years ago to maintain Hudson bombers that were manufactured in California and sent to Canada with the intent to support war efforts. Lockheed's history of supplying airplanes to the Royal Canadian Air Force provided the foundation that solidifies the company's domestic presence today. While Lockheed Martin Canada still has a very important relationship with the Royal Canadian Air Force (through delivery of the C-130J,) it also has a partnership with the Royal Canadian Navy and commercial sectors: the Lockheed Martin Canada portfolio now includes many military and commercial businesses, i.e. unmanned vehicle controls (via subsidiary CDL Systems) and the repair and overhaul of commercial airplane engines (via LM Commercial Engine Solutions). The company is consistently exploring opportunities developing radar platforms, simulation and training, repair and overhaul, military and renewable energy, as well as the recapitalization of the RCAF and RCN fleets.

Canadian Industry recently had the distinct pleasure of speaking with the Lockheed Martin Canadian team, including Bouchard, to talk about the company's strengths, plans for the future, and dedication to Canadians.

> "Innovation is the future of this company."

THE CANADIAN GOLD STANDARD IN DEFENCE TECHNOLOGY AND SYSTEMS

Lockheed Martin Canada has been operating for almost eight decades, providing a platform for the company that extends well beyond many organizations existing today. Lockheed Martin (global) has earned a reputation as a second-to-none innovator in four key areas: aeronautics, rotary and mission systems, missiles and fire controls, and space. Bouchard notes that although the Canadian arm of the company has traditionally been focused within these areas, dedicated to supporting Lockheed's global business development "in naval technology and systems integration, as well as the delivery and in-service support of military aircraft," Lockheed Martin Canada is also "now diversifying beyond defense to include autonomous systems, commercial aircraft, cyber security, and energy among others."

> "We are fortunate to have a long-standing relationship with Lockheed Martin in Canada that has contributed to our success."
>
> says Gastops CEO Dave Muir.
>
> "We look forward to continuing this partnership for many years to come."

As Bouchard notes, "innovation is the future of this company." R&D in Canada for Lockheed Martin comes from three main channels: spending on new capabilities, R&D investment in companies and universities, Canada's Industrial and Technological Benefits (ITB) program, and the acquisition of innovative companies in Canada to provide an opportunity for those companies to expand their operations including R&D and commercialization of new technology. According to a recent report on Lockheed Martin Canada operations and economic impact by PriceWaterhouseCoopers (PwC), spending on developing new company capabilities amounted to $18.8 million in the last decade. During this time, Lockheed Martin Canada spent $2.1 million on internal R&D to develop the Combat Management System CMS 330. The company also developed another technology through internal R&D called the Solar Tilt Axis Roll Tracker, which moves to follow the sun and is therefore more efficient than traditional fixed solar panels.

For over 35 years, Gastops' solutions have been used in Defence, Aerospace, Energy and Marine applications to optimize availability, readiness, maintenance, performance and safety of complex rotating equipment. We offer peace of mind to our customers by supporting the equipment that helps their aircraft fly, ships sail, trains roll, generators generate, and turbines turn.

Gastops designs, manufactures and supports advanced equipment sensing and analysis products, including on-line oil debris sensors, torque measurement sensors, turbine blade health sensors, and at-line wear debris analyzers.

Additionally, we offer a wide range of specialized technical and engineering services to assist in the design, development and in-service support of equipment control, monitoring and maintenance systems.

Gastops has applied our equipment condition analysis engineering capabilities to develop and execute fleet maintenance programs, which transform maintenance from the traditional scheduled or reactive maintenance, to a more proactive condition-based approach. This approach has also exposed us to the industry need to provide high performance, responsive, maintenance, repair and overhaul services for high value aviation components.

Gastops is headquartered in Ottawa, with offices in Halifax and St. John's and a network of partners all over the world.

Shipboard operations recognized
On May 16, AHS International recognized Canada's DND and aircraft manufacturer Sikorsky, a Lockheed Martin company, for "conducting an extraordinary international effort" to demonstrate the helicopter's ability to operate from the ship in high sea states typically found in the North Atlantic during winter.
The combined test force sailed five times into the waters off Nova Scotia from 2010-2017 between late December and early March when the weather conditions produced 6m (20-ft) wave heights and winds up to 55 knots (100 km/hour or 63 mph).

In total, the team flew 270 hours and performed approximately 975 landings on the flight decks of HMCS Montréal and HMCS Halifax.
A combined RCAF 12 Wing–Sikorsky aircrew demonstrated full use of the Cyclone's full authority fly-by-wire flight controls, which can hold the aircraft in a precise hover during high wind states.
Key among the design features Sikorsky engineered for the Cyclone were a retractable probe on the belly of the aircraft to more securely cinch the 29,300-lb. Cyclone to the ship's flight deck in high sea states.
The shipboard tests were part of a 10-year, 2,800-hour flight test program that's expected to conclude in early 2019.

R&D investment for Lockheed Martin Canada is paramount, as the company drives the next evolutions of programs and technologies necessary to Canada's future on the world stage of defense innovation. For instance, Lockheed Martin holds equity positions in small and medium sized companies in Canada that directly contribute to future commercial and military ventures. One example is an Ottawa company called ***contextere***, which is developing Artificial Intelligence (AI) software solutions that will help blue-collar workers, such as workers who perform aircraft maintenance, do their jobs more efficiently. Lockheed Martin investment into ***contextere*** was $1.1 million USD in 2017—all part of commitments associated with Canada's acquisition of its fleet of CC-130J tactical transport aircraft.

Another such project is "Project Descartes". In 2012, Lockheed Martin invested $300,000 into this project as part of a quantum computing research consortium led by Dalhousie University, which in turn led to a spinoff company called QRA (Halifax-based) that Lockheed Martin now holds an equity position in. Additionally, QRA has also received over $4 million in Lockheed investments. Just last year the Lockheed Martin Canada Aeronautics division contributed $2.7 million to the Marine Additive Manufacturing Centre of Excellence at the University of New Brunswick, in Fredericton. This new centre combines research, manufacturing, training and workforce development in a unique project that will work on developing a leading-edge and innovative technology to enable 3-D printing of metal parts.

CRUCIAL ECONOMIC IMPACT ON CANADIAN COMMUNITIES

Clearly, Lockheed Martin Canada operations have a tremendous impact on Canadians via R&D, innovation as well as growing small businesses and con-

The Second Heart Project

The Second Heart project at the University of Waterloo, which developed intelligent compression socks for soldiers, athletes and delivery people, is another example of technology motivated by Lockheed Martin that has a range of applications. In 2016, Lockheed Martin invested $1.2 million into this technology, which helped lead to a spinoff company called Pression. The technology is now also being designed for individuals who are more sedentary such as truck drivers, as well as people with cardiovascular disease.

tributing to local communities. "With 1,400 suppliers across Canada located in every province, local supply is very important but so is our regional footprint, diversity and selecting the best suppliers for the job at hand," says Bouchard. "We innovate right here in Canada and we partner with Canadian companies of all sizes, from all sectors and in every province, which often leads to their own growth potential and upward trajectory – especially export potential." A great example is the well-known and respected Lockheed Martin F-35 program. The F-35 is the world's most advanced fifth generation fighter, combining advanced stealth capabilities with fighter jet speed and agility to provide air superiority. According to Lockheed Martin, 110 Canadian companies of all sizes contribute to the F-35's success, and this is a very notable achievement for one company—to have such a critical impact on Canadian businesses. Bouchard adds: "We leverage the global reach of Lockheed Martin that has a presence in 52 countries. The real success in Canada is being at the point where we are now exporting Canadian-made technology and services to customers around the world, including the US, UK, New Zealand, Chile and the Middle East."

It is important to note the company's incredible export potential, as Canada looks to be more productive and dominant in the global marketplace: Lockheed Martin Canada has been selected by both Chile and New Zealand to provide the combat management system and integration for key frigate programs—which according to the company is the first time in Canadian history that foreign navies are sending their ships to Canada for modernization.

CDL Systems

Lockheed Martin CDL Systems, located in Calgary, produces software for Unmanned Aerial Vehicles (UAVs). It was acquired by Lockheed Martin in 2012 in order to expand its capabilities in this industry. Using Lockheed Martin's Indago 2 drone, it completed testing of the first beyond-line-of-sight pipeline, well-site and power-line inspections in Canada in March 2017. Uniquely, all of its employees are derived from a University of Calgary co-op program.

Notably, in the last 10 years, Lockheed Martin's business operations, investments in R&D and contracts in Canada have generated $3.8 million in GDP, led to 36,521 full time jobs in Canada, $2.5 billion in wages and exported more than $2 billion in products and services (PwC report). According to the PwC report, in a typical year, the economic impact of Lockheed Martin on the Canadian economy is: $379 million in GDP, 1,000 direct FTE jobs, 2,652 additional FTE jobs supported, $254 million in labour income, $147 million in total tax impact, and $193 million in exports to the US.

In 2017, average labour income per direct Lockheed Martin Canada employee was $90,527 and average labour income for all employees supported by Lockheed Martin (i.e. direct, indirect and induced) was $77,500. The Canadian cities in which Lockheed Martin has had the largest impact are Montreal, Ottawa, and Halifax. In 2017, the numbers to support this were as follows: $47 million in GDP and 463 jobs in Montreal; $43 million in GDP and 459 jobs in Ottawa; and $28 million in GDP and 393 jobs in Halifax, according to the PwC report.

COMMUNITY CONTRIBUTIONS: PARAMOUNT TO THE LOCKHEED MANDATE

Any Canadian company that plans to do well on the home front, and subsequently internationally needs to play a community role. And while many companies see CSR as an "on paper" initiative, Lockheed Martin Canada is a responsible community citizen inside and out. The Lockheed Martin set of values relies on an idea to strengthen the quality of communities in which employees live and work. In the last decade, the company has provided over $1 million in philanthropic contributes and thousands of employee volunteer hours to a variety of Canadian community organizations in two key areas: science, technology, engineering, and mathematics (STEM) programs and education to inspire the next generation of Canadian innovators, and also efforts that support veterans, military members and their families.

For instance, Actua is a Canadian charitable organization that prepares young Canadians to be innovators and leaders by engaging them in exciting and

STELIA Aerospace North America is a subsidiary wholly-owned by STELIA Aerospace, one of the world's leaders in the areas of aerostructures, pilot seats and business and first class passenger seats. With revenues of €2.2 billion in 2017and more than 6,900 employees worldwide, STELIA Aerospace supports major aeronautical companies such as Airbus, ATR, Boeing, Bombardier, Dassault, Etihad Airways, Singapore Airlines and Thai Airways.

STELIA North America Composites is one of the leading manufacturers of advanced composite structures and sub-assemblies for the aeronautic, space and defence industries. Headquartered in Lunenburg Nova Scotia, STELIA North America leverages its capabilities, synergies and expertise to offer services in design & analysis, manufacturing of complex composite structures, prototyping and R&D. Some of its key processes include hand lay-up, filament winding, compression molding, hot drape forming, CNC machining (5 Axis), Automated Fiber Placement (AFP) and Non-destructive Inspection.

STELIA North America is proud to operate a sustainable and profitable business with a clear vision to serving global aeronautical leaders.To meet the new challenges of the aeronautical industry and develop increasingly innovative products, STELIA North America is continually looking for potential leaders with technical expertise in lean concepts, efficiency and productivity.

Lockheed Martin Canada employees volunteering with Habitat for Humanity

accessible STEM experiences that build critical skills and confidence. According to Lockheed Martin, over the years, Actua has inspired over 225,000 youth, reaching every province and territory in Canada through the delivery of summer camps, classroom workshops, clubs and community outreach activities. Notably, the organization has a National Girls Program specifically designed at inspiring young women to fulfill their role as leaders in STEM and encourage them in STEM fields.

When it comes to support for military families and veterans, the company concentrates on national programs for transitioning military members into entrepreneurial activities, and also financially supports a program called "Soldier On": a Canadian Armed Forces program committed to supporting veterans and serving members to adapt and overcome permanent physical or mental health injuries through physical activity and sport. Lockheed Martin Canada also sponsors Ottawa's Canadian Army Run, supports Wounded Warriors Canada (a charity that supports veterans, first responders, and their families dealing with trauma and mental health issues), and contributes to a charitable, non-partisan organization that helps veterans who are seeking jobs in the civilian workforce such as the Prince's Operation Entrepreneur (POE).

Another area of paramount importance is Lockheed Martin's work with Canadian Indigenous communities—a focus for many Canadian companies that is absolutely necessary to being part of the country's corporate/social fabric. Bouchard says that "Lockheed Martin Canada recognizes the importance of Canada's Indigenous communities and places significant effort in contributing to initiatives and programs that support their social and economic development, especially mentorship and job training to encourage the next generation of Indigenous entrepreneurs, business leaders and skilled workers." Lockheed Martin-owned Sikorsky in 2016 transferred

Superclusters

Lockheed Martin is a key player in several aerospace and defence clusters across Canada, as well as having connections with some of Canada's recently announced Superclusters:

Lockheed Martin contributes to the success of the Quebec Aerospace cluster through LMCES, its large network of suppliers, as well as its participation in industry associations and linkages with educational institutions. Many of these relationships have a long history and contribute to sustainable growth.

Lockheed Martin contributes to the defence, technology and aerospace clusters in Eastern and Southern Ontario.

Lockheed Martin has been in Atlantic Canada for decades and has built partnerships and long-term relationships with organizations, thus contributing to robust communities within regional clusters.

From the Digital Technology Supercluster in BC to the Advanced Manufacturing Supercluster in Ontario and the SCALE.AI Supercluster in Quebec and the Ocean Supercluster in the Maritimes, Lockheed Martin plays an important role in contributing to the ecosystems that sustain most of Canada's Superclusters. C/O PwC report

$2.3 million in Canadian components are part of every F-35 assembled, resulting in more than $1 billion contracted to Canadian industry through 110 Canadian companies thus far.

an S-76A™ helicopter maintenance trainer to the Saskatchewan Indian Institute of Technologies (SIIT) in Saskatoon. According to Lockheed, this trainer plays a critical role in providing hands-on training for students looking to pursue careers as highly skilled maintenance workers, which is a growing field especially in northern and remote communities that rely on helicopter transportation. The company supports a pilot program (since 2015) led by the Joint Economic Development Initiative (JEDI), that enables Indigenous people to pursue business opportunities related to Canada's National Shipbuilding Strategy. Lockheed also sponsors an Indigenous business pitch competition that has been held in the company's IMPACT Centre in its facility in Kanata, Ontario.

When discussing Indigenous relations with Gary Fudge, vice president and general manager of Rotary and Mission Systems for Lockheed Martin Canada, he noted that "it is hard to believe that the economic impact of six ice-capable patrol ships being built at the Halifax Shipyard is felt nearly 4,500 kilometres away on the Capilano First Nations Reserve due to an opportunity developed by Lockheed Martin Canada. The company was selected by Irving Shipbuilding Inc. to deliver an adapted version of its trusted Combat Management System 330 for surveillance purposes on Canada's newest fleet of Arctic and Offshore Patrol Ships, and an 100% Aboriginal-owned business, Toolcomm, will provide specialized VoIP and High Frequency Radios for this project." Toolcomm is based in North Vancouver, with facilities on the Capilano First Nations Reserve.

"Lockheed Martin has over 100 years of innovation and expertise."

Lockheed Martin has invested millions in Newfoundland's Solace Power: www.solace.ca.

LOOKING AHEAD

When it comes to future growth for the company and the communities it supports, Lockheed Martin Canada will bring its innovative spirit to every project it undertakes. "Lockheed Martin has over 100 years of innovation and expertise in building the most advanced aircraft, being a part of every Space mission to Mars and customizing solutions for global defence and security needs from the bottom of the ocean to the beyond the stratosphere," says Bouchard. "While we will continue to develop our core capabilities in aircraft delivery and sustainment as well as naval technology and combat systems integration in Canada, we will advance export opportunities and move beyond the defence to new areas."

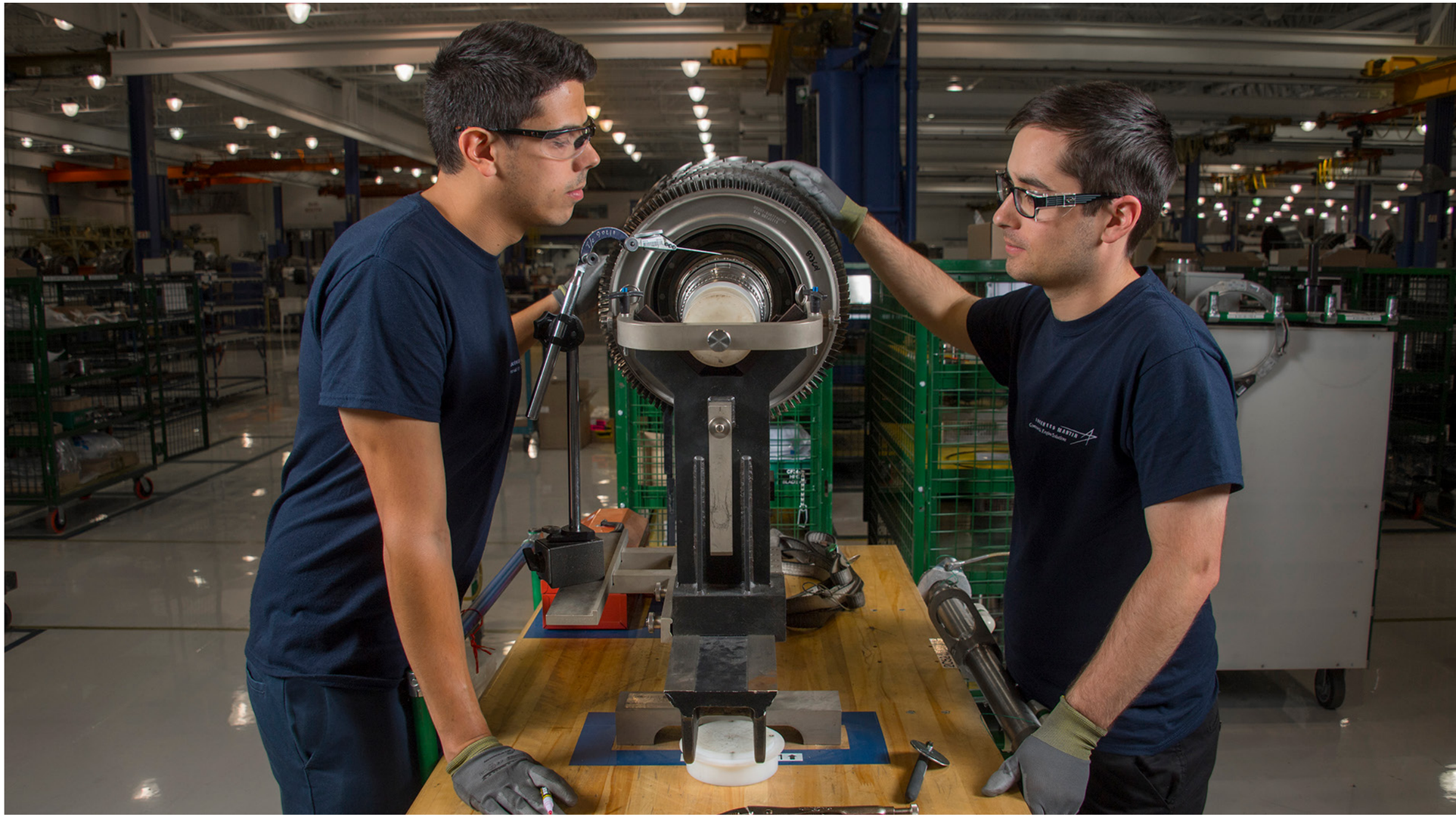
With two of the largest Canadian procurement initiatives on the horizon – the Canadian Surface Combatant and the Future Fighter Capability Project – Lockheed Martin is well positioned to continue its tradition of serving as Canada's trusted defence partner, supporting people and industrial development with ethics and integrity at the core of the business.

Lockheed STEM programs

The STEAM Horizon Awards Scholarships led by Ingenium – Canada's Museums of Sciences and Innovation to recognize young Canadians who promote positive changes throughout their community using science, technology, engineering, arts, and math.

Cubes in Space, which helps students embrace their curiosity, develop logical and methodological thought, engage in creative problem solving and experience the joy of learning through working on experiments that are eventually launched into space.

Many Lockheed Martin Canada employees are also passionate about STEM and dedicate a significant amount of time volunteering in classrooms and in support of local programs.



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