AV&R: «le pied sur l'accélérateur de la croissance»

Le nouveau président d'AV&R, Jean-François Dupont.
PHOTO ALAIN ROBERGE, ARCHIVES LA PRESSE

MARIE TISON
La Presse

Maintenant qu'AV&R a complété sa fusion avec IMAC Automatisation, elle entend accentuer sa présence sur la scène internationale.

«Nous sommes vraiment excités, a lancé le nouveau président d'AV&R, Jean-François Dupont, en entrevue téléphonique hier. Enfin, nous allons lâcher la paperasse. Tout le monde a hâte de mettre ensemble l'expertise des deux groupes.»

AV&R Vision&Robotique, une entreprise située dans le Vieux-Montréal, est spécialisée dans la vision artificielle et la robotique pour l'industrie aéronautique. Pour sa part, IMAC
Automatisation, de Saint-Bruno, est spécialisée dans l'automatisation industrielle et les équipements de moulage sous pression.

La conclusion de la transaction, annoncée en juin dernier, a pris plus de temps que prévu. Les parties ont signé les derniers documents vendredi dernier.

«Au début, on pensait davantage à une acquisition, mais Carl Thibault et Sylvain Rodier [les dirigeants d'IMAC] ont été emballés par notre plan stratégique et ont décidé d'embarquer avec nous, a raconté M. Dupont. Ça a changé un peu le plan, mais finalement, c'est une excellente chose pour nous. Nous ajoutons de l'expérience et de la profondeur à l'équipe d'actionnaires et de dirigeants.»

M. Dupont, qui était cofondateur et chef de l'exploitation d'AV&R Vision&Robotique, devient président de la nouvelle entité. L'ancien président, Eric Beauregard, quitte son poste mais demeure administrateur de la société.

«C'était planifié depuis longtemps, a affirmé M. Dupont. Eric, c'est un gars de mandats. Une fois qu'il l'a accompli, il regarde ailleurs.»

Fondaction, le fonds de travailleurs de la CSN, est un partenaire d'AV&R depuis 2006. L'autre grand fonds de travailleurs, le Fonds de solidarité FTQ, a participé financièrement à la transaction.

«Ils y croyaient, a soutenu M. Dupont. Ils voyaient le potentiel de croissance, surtout à l'international.»

AV&R a déjà vendu de l'équipement automatisé dans 12 pays. La fusion avec IMAC lui permettra d'élargir son offre d'équipements.

Un mandat clair

«Éventuellement, ça pourrait aller jusqu'à des lignes complètes de production», a indiqué M. Dupont.

Il a ajouté que le conseil d'administration avait donné un mandat clair à l'équipe de direction. «Il faut mettre le pied sur l'accélérateur de la croissance.»

AV&R entend notamment ouvrir des bureaux de vente et de soutien aux États-Unis, en Europe et en Asie.

«Quand les clients cherchent de l'innovation, ils acceptent d'aller à l'étranger, mais une fois qu'ils l'ont en main, ils veulent avoir un support local», a déclaré M. Dupont.
One way to solve currency risk: ‘It’s our way or the highway’

Paul Brent, Powered by The Globe and Mail Custom Content Group

Canadian aerospace firm insists on payment in Canadian dollars from its customers abroad

Most companies approach foreign business cautiously and with full awareness of the potential downsides. They must learn about foreign jurisdictions, evaluate new partners and face the possibility of not getting paid for their products and services.

But dealing with foreign currencies poses a challenge, too. Large enterprises can afford to use sophisticated hedging strategies to ensure they will protected should their home currency depreciate over the life of a contract. But smaller companies typically have fewer options and can find themselves on the wrong end of a currency exchange.
That was the situation Montreal–based AV&R Aerospace found itself in during 2009. The company, a world leader in creating automatic systems for the inspection and finishing of critical aircraft components such as engine parts, was operating in the midst of the recession and found itself facing losses on some large U.S. contracts.

It was a turning point for AV&R and its chief executive officer, Eric Beauregard, who vowed never again.

“We used to take whatever currency customers were offering us, mostly U.S. dollars, because in aerospace it is mostly U.S. dollars. Then a couple of times we got some exchange losses – $25,000, $50,000 is a lot for a small company.”

After meeting with his executive team, Beauregard instituted a courageous, if simple, currency policy – insisting on Canadian dollars. “If you want to buy a machine from us, it is in Canadian.”

The new policy came at the same time that the company decided to expand beyond North America. When company officials met with prospective customers in Europe and Asia, they stated flatly that contracts would be priced in Canadian dollars and would have to be paid in loonies as well.

Perhaps surprisingly, AV&R did not lose out on a single contract because of its currency stance. Beauregard, who gets a bit evangelical on the topic, added that other Canadian exporters should consider adopting a similar position if they want to protect against foreign exchange shifts.

“If you are able to export worldwide, I would doubt it is because you are cheaper,” he said. “I would think that it is because you have some sort of design or technology, something different that makes you desirable.”

In most cases, AV&R executives are sitting down with customers for their expensive robotics systems because they were referred by an existing customer or because those buyers did some research and due diligence. They are pretty much already sold, in other words, and the issue of currency is just another detail that must be hammered out before a contract is signed.

“Yes, they resist. Yes, they say their accounting system is not set up to pay in foreign money, they all try these stories,” said Beauregard. “At the end of the day, surprisingly, they are able to [pay in Canadian dollars] when we stick to our policy.”

The strategy has paid off. Since the recession, the company has expanded its client base from Canadian and U.S. customers to those across the Atlantic and Pacific. Currently its annual revenue of approximately $16–million is split equally among customers in Canada, the U.S., Asia and Europe.
The AV&R chief added that all too often, Canadian companies are simply unwilling to impose their own stipulations and potentially jeopardize a sale.

“They are scared to lose a contract,” he said. “The buyer’s [stance] is to treat you like they have 20 other people that can give the same product. That you are a commodity.

“But at the end of the day, if you did a good job, you spoke to the right people, you convinced the right people and they want to do business with you ... I doubt that a customer would cancel everything and go to another supplier.”

Though his company has had some spirited discussions with buyers among its new customers, AV&R holds to its principles because it knows that someone higher up at the company has already agreed to make an order, which can run from hundreds of thousands to millions of dollars. “I don’t recall losing any customer over currency,” said Mr. Beauregard.

He added that the company does make a grandfathered exception for U.S. aerospace giants such as GE Aviation or Pratt & Whitney and accepts payment in U.S. dollars because of existing relationships as well as the fact that they are “strategic” customers.

Given the recent slide in the Canadian dollar, that more flexible approach to its U.S. clients should provide it with an expected currency exchange windfall.

“Most of our projects started a year ago and the currency was set at one-to-one,” he said. “Right now it is good for us, but it can go on the other side.”
Adaptive profiling of leading and trailing edges of gas turbine airfoil

AV&R Aerospace’s goal, as it works with its customers, is to be the leader in industrial automation for the aerospace and energy industries by offering intelligent automation solutions to optimise manufacturing processes and to control quality. As it delivers critical solutions, the company has developed a broad range of expertise enabling robots to perform complex tasks that traditionally could be performed only by humans. This allows their customers to achieve high process repeatability and lower cost while enhancing precision in such finishing operations as deburring, polishing, profiling, blending, grinding, buffing and trimming.

The company differentiates itself by providing highly engineered solutions that integrate in depth knowledge of the machining process for optimized tool and abrasive selection and of sophisticated robot control based on inspection feedback. Customers have turned to AV&R Aerospace because; it delivers not only a workcell, but an integrated manufacturing process from the simplest to the most complex of machined parts.

In the aerospace and energy industries, AV&R Aerospace’s expertise have been leveraged in projects for the manufacturing of critical gas turbine rotating parts for both new make and repair.

Context

Fuel consumption for commercial aircraft represents a tremendous expense to airlines and moreover the U.S. Energy Information Administration (EIA) expects jet fuel prices to increase steadily from 2011 onward.

This reality has pushed the engine manufacturers to increase fuel efficiency. To do so, they improved aerodynamics on blades & vanes by using tighter tolerances and more complex elliptical 3D profile. Tolerances on newer engines are around ± 0.0015 in (37 μm) and are planned to go to ± 0.001 in (25 μm). With these new requirements manual profiling is no longer sustainable. Aspects such as labour cost reduction, difficulty to find skilled operator and to eliminate injury have also push to automate this operation. On the repair side, in addition of fuel saving, better aerodynamic leads also to less scrap and longer blade life.

Solution

To answer the gas turbine manufacturers’ needs, AV&R Aerospace has worked closely with their customers to develop an automated profiling system which creates high precision elliptical profiles on blades and vanes according to the new engine design
requirements. This 6-axis system integrates adaptive and closed-loop capabilities coupled with leading and trailing edge profile inspection to reach a ± 1.5 thousandth of an inch (± 37.5 μm) tolerance. In addition, the system can polish the blade’s foil, platform and fillet. When adapting the solution for MRO requirements weld blend capabilities has been included for repaired blades that have material added.

One of the largest challenges manufacturing engineers face with automating typically manual processes is being able to handle in-process variations associated with the parts and the process parameters. Therefore to ensure the solution would be sustainable over time and slight manufacturing variations it compensates for leading and trailing edge morphology and positioning variations. To deal with process variations themselves the system compensates for abrasive wear and corresponding changes in material removal rates. Combining all these factors together the machining program is adjusted in real-time for each part being profiled.

To be able to meet customers’ tolerances and reduce time required to introduce new parts in production, AV&R Aerospace has developed an automated method to create the machining program recipe. Instead of creating the machining program with CAD-CAM software, AV&R Aerospace’s automatic teaching software analyses the theoretical 3D models before and after profiling and with artificial intelligence and algorithms creates the machining program. Since 3D models are not exactly as the real part, a laser inspection system analyses the profile quality and if it’s required, automatically adjusts the machining program. With this technology their customers can put the 3D models with 5 to 10 parts in the system to automatically learn a new part.

Confirm results

Today customers, including most of the major OEM engine manufacturers and their suppliers, use AV&R Aerospace profiling and polishing systems to improve aerodynamic performance and reduce labour cost. Systems have been deployed on 4 continents for both new make and MRO facilities. As AV&R Aerospace continues to work with their customers the solution is being expanded from compressor blades and vanes to high pressure turbine blades and fan blades. The goal is to work with any customer who has edges with tight profiles tolerances or surfaces requiring precision finishing.

These technologies have brought the following advantages to the end users:

- Fuel burn reduction
- Performance improvement (maximum profile tolerances ± 0.0015 in (37 μm), average profile tolerance less than ± 0.001 in (25 μm))
- Compensate for production variations
- Airfoils life improvement
- High precision and repeatability
- Scrap rate reduction
- Labour cost reduction
- No need to highly skill labour
- Eliminate injuries
- Eliminate some inspection operations
- Consumable reduction (abrasive wheel, sand belts)
- Short time to put new part in production

AV&R Aerospace’s profiling system won the Society of Manufacturing Engineers’ 2012 Innovations That Could Change the Way You Manufacture Award.

François Arrien, AV&R Aerospace
info@avr-global.com
MRO Network
Robots Required for Engine Operations

For certain high-precision aerospace processes, particularly for jet turbine engines, only robots can get the job done. "In jet engine production, especially in the leading edge profiling of the engine blades, using automated systems with robotics is the best way to do the job," noted Chris Blanchette, manager, aerospace automation, FANUC America Corp. (Rochester, MI). "You can't do it with people."

Robotic automation is helping aerospace manufacturers improve throughput, quality, and get finer process control, he added. "Automation and robotics are really helping aerospace compete to meet these requirements to improve throughput."

In July 2013, GE Aviation opened a new robotics R&D center at its Bromont, Quebec, Canada, facility that manufactures many components for GE's aircraft engines, including the CFM56 engines for the Boeing 737 and Airbus 320 aircraft, and GE9x engines for the Boeing 787 and Boeing 747-8.

The company invested $61.4 million, including $8 million from the Quebec government, in the new Global Robotics, Automation and Instrumentation Center at the Bromont facility location, which is one of the most productive global sites operated by GE Aviation. The new R&D center is developing advanced robotic processes, software applications and intellectual property that will be exported to GE Aviation facilities around the world.

"We're in the infancy stages of our deployment of automation. If you look at the way we make engines today, we've barely scratched the surface of opportunities," said Alain Ouellette, manager, Global Automation and Instrumentation R&D Center. "We still have multiple areas to explore. If you look at automotive, they installed the first robots in 1961. Today, you cannot find an auto facility without them."

While aerospace automation is perceived as low volume, Ouellette said that is changing. "The automation technologies have evolved over the last 25 years, the complexity has been reduced, and today we need to contemplate deploying more automation. We want to compete with other aircraft engine manufacturers, and we are at the point where some of the engines cannot be built without automation."

"There's a significant push in aerospace assembly to move away from overhead cranes."

A developer of robotic vision and inspection solutions, AV&R Aerospace (AV&R; Montreal, Quebec, Canada) is an integrator of FANUC robotics and a developer of robotic leading edge and trailing edge profiling machines for turbine engine blade manufacturing. The company is working with the GE Aviation Bromont facility on many projects, noted Eric Beauregard, AV&R Aerospace CEO. "We're specializing in aerospace, mostly in turbine jet
engine or for energy power generation," Beauregard said. Many of the systems the integrator develops are in robotic metal removal machining, grinding and deburring as well as in the robotic visual inspection systems for complex gas turbine engine blades. "A 3D visual inspection is in development," said Beauregard, noting that AV&R Aerospace's customers include all the major makers of jet engines including Rolls Royce, Pratt & Whitney and GE.

"We did many different projects in cooperation with GE there, one of which is the leading edge profiling system," he added of the Bromont GE facility, which has more than 120 robotic cells. "The system reads the leading edge with a laser, and based on that feedback profile it gets, it adjusts according to the CAD model. It meets the tolerance and the shape that GE wants to make that part efficient. These parts are all forged compressor blades, then they need to profile it, put a shape on it."

The Bromont facility aims to increase productivity on the engine blade manufacturing, noted Ouellette, and the robots also help with improving safety aspects for workers. With the automation, variation on the parts is dramatically reduced. "A robot will allow you to go to less than ±5 thousandths on part positioning," Ouellette added. "If you put in multiple operators in manual production you introduce even more variation than with a single operator. If you can eliminate that significant source of variation, it's a huge impact on quality." ME
LA ROBOTIQUE QUÉBÉCOISE QUI VOYAGE


DENISE PROULX
Agence QMI

L’entreprise AV&R fabrique des pièces spécialisées en finition robotisée et en inspection visuelle automatisée sur des parties de turbines à gaz, pour des clients prestigieux dans 14 pays, dont Pratt & Whitney, GE et Rolls-Royce.

Cette expertise de pointe a été développée depuis 20 ans par Jean-François Dupont, le président d’AV&R et une équipe de pionniers dans le secteur.


« On s’est rassemblé dans une multinationale qui n’avait rien à voir avec notre expertise et qui ne s’intéressait pas vraiment à la robotique. On nous a demandé d’attaquer des projets innovateurs techniquement complexes, mais sans obligation de rentabilité », explique le président d’AV&R.

Pendant cinq ans, le groupe de Vision et Robotique a conservé ses rêves d’auto- nomie. Il lui a fallu trois ans d’efforts pour réussir à convaincre Invensys de les laisser voler de leurs propres ailes. La division Vision & Robotique d’Invensys fut finalement acquise par Averna Technologies en avril 2005, avec la participation des dirigeants fonda- teurs.

« C’est à ce moment que l’aventure a vraiment commencé », se rappelle Jean- François Dupont.

DES AFFAIRES AMÉRICAINES

Mais les affaires ne se négocieraient pas au Québec, qui n’est pas à l’avant-garde dans le domaine de la robotique. C’est en sollicitant des clients connus chez Inven- sys, qu’AV&R a créé sa réputation dans le domaine de l’aéronautique, du nu- cléaire, de l’automobile et du pharma- ceutique.

Quelque 85 % de ses revenus proviennent des États-Unis et 15 % du Canada. Lorsque la crise économique de 2008 a frappé fort, AV&R n’a eu d’autres choix que de regarder ailleurs. L’entreprise est retournée vers des clients européens et asiatiques qui les sollicitaient depuis quelques années. « Un an plus tard, 77 % de nos revenus étaient générés hors de l’Amérique du Nord. »

UNE FUSION INSPIRANTE


« Cette fusion ajoute de l’expérience et de la maturité à AV&R. Nous partageons les mêmes valeurs. C’est le mix parfait », conclut Jean-François Dupont.