



**District  
news  
A3-8, B2, 5**



**Fund-  
raisers  
B2**



**Local  
sports  
B6, B7**

# Redundancy = safety

Hispano-Suiza is the kind of place you have to look for. It doesn't leap out and shove itself in your face.

You've probably seen the building if you've come off The 115 and swung right on the Parkway exit. Make sure traffic permits and, then, cast a glance over your left shoulder. There's the Hispano-Suiza sign in understated blue lettering. The sign announces a story well worth telling.

It's a tale that has its origins in the birth of the automobile era and its future in aviation electronics systems engineered to withstand direct lightning hits and to continue to function through the electronic firestorm generated by a nuclear explosion.

If you're old enough and male, chances are that you might garner a hint from the company name. Hispano-Suiza harks back to the turn of the century, the second last century, just as the 1800s slid into the 1900s, and not very long after the invention of the automobile.

Automobile racing may be said to date from the moment the second automobile was created. And the alliance of a Spaniard (Hispano) and a Swiss (Suiza) made a global name for itself building racing cars called Hispano-Suizas. Through a do-or-die process which demands industry change with the times, Hispano-Suiza morphed from auto-maker into a company out near the pointy end of the aerospace industry. It's located here in Peterborough, in that building with the blue lettering, actually at 2000 Fisher Drive.

Over the years, Hispano-Suiza and racing rival Messier-Bugatti, became linked through a complex series of mergers, takeovers and restructuring deals. Firmly entrenched in aviation, the British firm Dowty, a specialist in landing gear, moved to Ajax in the 1940s to escape World War II, and in 1980, purchased a small Peterborough firm, Syntron, and turned it into Dowty Electronics. European mergers melded Dowty with, Messier-Bugatti.

Today, Hispano-Suiza in Peterborough is a part of the Messier-Dowty Group, within a huge orga-



**DROPPING IN  
GARY BALL**

nization called SAFRAN, with close to \$5 billion US in sales and 50,000 employees globally.

The best person to drop in on for the real Hispano-Suiza story is a former refugee from the Czechoslovakian airforce, long-time Peterborough resident **George Novacek**. Novacek is vice-president and general manager of Hispano-Suiza. And he's quite willing to share tales of a company where fully two-

thirds of the workforce is made up of engineers. And he'll throw in, free of charge, his company's link to an French racing firm with the name Bugatti, which battled Hispano-Suiza on early auto racing tracks. In actual fact, designer **Ettore Bugatti** was born in Italy, but his racing cars were developed in the Alsace region of France, so Italy, France and Germany have some claim to the Bugatti marque.

Hispano-Suiza and Bugatti live on in the Hispano-Suiza plant in Peterborough, from auto-maker to aerospace systems design and production. Let's see how these venerable names link to the modern aviation world.

As Novacek describes it, aerospace electronics is Hispano-Suiza's whole reason for being. The company provides the components and systems which operate such in-flight equipment as engine controls, de-icing controls, landing gear controllers and the like. Those systems, their engineering and production, require fistfuls of engineers and technicians and they are creating some (positive) growing pains for the company in Peterborough.

"We're actually in two buildings," Novacek says. "We're here and we're across the road. A good part of engineering (department) is there and production is here."

And things are booming. An expansion of the facilities has been delayed, and that means things are crowded enough that Novacek hasn't enough space in his own office to conduct an interview. It's done, instead, on a guided tour of the production floor and follow-up in the company's board room.

The production floor has all kinds of shiny, high-tech machines



Gary Ball, Examiner

Hispano-Suiza vice-president and general manager George Novacek (right) and the company's engineering director, Alex Daher.

and more white smocks than you'll see in a hospital operating room. Circuit boards must not be contaminated by dust, dirt or static electricity that could compromise the work they're intended to do. They're destined for aircraft and have to be as "fail-safe" as possible.

The soldering that goes into production of some of these circuit boards is achieved in the precise temperature control of a specialized oven, ensuring sufficient heat to make the connections electronically sound, without being so high as to damage the board or its micro-miniature components.

The nature of modern aviation is such, he says, that the company's product has been used in perhaps 350 to 500 aircraft in 20 years.

"We do expect quite a bit of growth in the next two years," he says.

(Please see: Engineering...Page A3)

## EXAMINER NUMBERS

### NEWS:

If you have information or photographs about your community that you would like to share with our readers, please send them to Communities c/o Werner Bergen at 730 The Kingsway, PO Box 3890, K9J 8L4, or email at news1@peterboroughexaminer.com or fax it to 743-4581 or telephone 745-4641.

The Examiner Community Weekly is printed once a week by The Peterborough Examiner.

**Publisher:** Jim Ambrose

**Managing editor:** Ed Arnold

**Editors:**

**Region:** Werner Bergen ext. 253; city desk ext. 251.

**Clubs, fund-raising:** Rob McCormick, ext 244

**Sports:** Bob Feaver, ext 260, e mail

sports@peterboroughexaminer.com

### SUBSCRIBE:

745-4641  
ext. 211,212, 213  
fax 741-3217

### ADVERTISING:

**Display**  
745-4641 ext. 231  
fax 741-3217  
retail1@peterboroughexaminer.com

### Classified:

742-9271  
fax 741-3217  
classified@peterboroughexaminer.com

### Real Estate:

745-4641 ext. 227  
fax 745-8199  
satreal@peterboroughexaminer.com  
The Examiner is published Monday to Saturday except holidays by Osprey Media Group Inc.

# Engineering staff drawn from all over

(Continued from Page A1)

The nature of the industry, he says, is such that the engineering (or inventing and perfecting) of products and systems eats up huge amounts of money before full-scale production and sales can reap the financial rewards.

What's ahead for Hispano-Suiza, he says, is the opportunity to produce and sell the fruits of years of engineering.

"We have 150 staff," he says. "That's with only about 30 people in production and the rest largely in engineering."

Engineering staff, he says, is drawn from virtually everywhere on the globe, from Russia, through Asia and even the middle east.

"Talent is our only hiring criterion," Novacek says.

The Hispano-Suiza growth curve won't see large increases in the numbers of production staff. Instead, the investment will be made in production equipment. Job increases will come in areas that support production done by these machines.

Those support workers, Novacek says, have largely been local hires over the years.

But he notes that extensive training is required to bring someone off the street and "up to speed" in the high-tech production environment.

"Today's technology means that the work can no longer be done by hand."

That technology includes reels and reels of components, semiconductors, capacitors, resistors, etc., which are fed into printed circuit board-making equipment which is capable of feats such as soldering spots whose separations can be measured in microns.

For reference, a human hair can run from 40 to 120 microns in diameter. Hispano-Suiza circuit boards can solder connections with only two or three microns separating them.

This same machine can feed up to 190 tape rolls of components to the circuit board at the same time.

A part of the cost of aviation systems and equipment goes, Novacek says, into creating a paper trail that can be followed right back to individual micro-components, if necessary, in the event of a crash.

"That is the bane of our industry," he says, "the paperwork."

But the aim, he says, is safety.

Safety in the air means "redundancy, multiple redundancy," so that components and systems are backed up with alternates, three four or five times.

Tasks in aviation can be complex.

Novacek points out a black box, a Hispano-Suiza product, that controls the de-icing of the four propellers on huge Hercules aircraft.

"Each one of these boxes controls 60 kilowatts of power (generated on board the aircraft). Control is critical because we cannot de-ice all four propellers at the same time, so we have to switch it on

and off. And we need computing, because to de-ice you cannot simply melt the ice. The water would just run off and freeze somewhere else. We have to heat it just enough that centrifugal force will throw it (the ice) away."

Sensors look at variables such as airspeed, humidity and altitude and so on, and the black box calculates the best heating necessary to remove ice from propellers.

Another box Novacek points out is a landing-gear controller, responsible for the extension and retraction of the landing gear on the B-22, the tilt-rotor aircraft, a helicopter combined with a regular aircraft, by Boeing.

"This one is a nose-wheel steering system for the Bombardier regional jet and this is a horizontal stabilization controller, also for the regional jet."

"We provide systems for everybody who is in aerospace," Novacek says, smiling.

"There's only a handful (in the industry) now. You've got Loughheed, Boeing, Bombardier. There's Gulfstream, Raytheon with the Airbus in Europe and that's just about it.

"Now we're looking at doing business with the Russians."

Most of the Hispano-Suiza business, he says, is generated through the aerospace giant Pratt and Whitney.

"Most of the industry (end-users of Hispano-Suiza systems and products) we do not deal with directly. Electronics don't just go on an aircraft directly. They have to be a part of the system."

Quality-control and fail-safe backups are essential in this business, Novacek says. This leads to extensive testing and retesting, from the x-raying of all circuit boards to the rugged testing of components that he calls "shake and bake."

In the shake and bake lab, everything is subjected to the stresses of vibration on three different axes and to the hot and cold cycles that range from temperatures of -40C to

+50 and beyond. The accelerated torture testing gets the electronics over a statistical likelihood of "infant mortality" and into the world of "mature" circuit boards and systems that are likely to operate error free for many more years.

Hispano-Suiza's future, Novacek believes, is in the development of new electronic systems that can be re-used.

"The best way to describe it is that it is very similar to your PC (personal computer). We have the hardware, which is universal, and then you have the operating system which is pretty well universal and then you have application software which can take the same kind of unit and make it into an engine controller, a landing gear controller and so on.

"The biggest difference between the PC and ourselves is that everything here is double or triple redundant. The safety has to be there."

"Typically, a system (in aviation) requires that you prove 10 to the power of minus nine probability of failure. In terms of living creatures this kind of reliability never happens.

"We did part of the work on the electronic thrust reversal system (ETRAC) for the new Airbus A380. And there we had to guarantee, 10 to the power of minus 18, against the probability of the deployment of the thrusters in the air."

That kind of guarantee, he says, is statistical.

"You know statistically, each and every component guaranteed by the supplier has a certain level of reliability.

"Let's say that when you do all the calculations for a certain unit, you come up with 10 to the minus-six probability of failure. That is when you put in dual redundancy so that now you have two channels each of 10 to the minus-six which will give you 10 to the minus-12."

Novacek says that this sort of fail-safe and redundancy protection is one of the reasons why few modern aviation crashes are

blamed on equipment failure. The safeguards in equipment and systems all but dictate that crashes will have a "human judgment error" component.

"Anything that we build here," Novacek says proudly, "has to survive a hit by lightning and continue to operate.

"We had one unit which was a controller for the landing gear of a military B22 that had to be built to survive the electro-magnetic pulse that results from a nuclear explosion."

How's that for tough?

With all the pride he has in the products that come out of Hispano-Suiza, Novacek is (if it's possible) even more proud of the talent pool behind those modest blue letters on the side of the building.

"We have great people and it took us a long time to build up that talent. We've gotten where we are

through a very long process, and not everything can be handed down on paper."

***If you have a suggestion for Dropping In, contact Gary Ball at 745-4641, ext. 210, or Rob McCormick at ext. 244, or e-mail life@peterboroughexaminer.com.***

61429581  
3 x 60.00  
BURLEIGH ISLAND LODGE  
BURLEIGH ISLAND LODG

61432663  
4 x 80.00  
916310 ONTARIO LIMITED  
916310 ONTARIO LIMIT

61427813  
4 x 50.00  
GHW MARKETING (WIGAMOG VILLAS)  
GHW MARKETING (WIGAM