





Mexico's Aerospace Industry Rising thanks to Education

Education and training are the keys to the development of Mexico's burgeoning aerospace industry.

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01 **THE HANGAR** of Bombardier in Querétaro.

02 **AMPHIBIOUS** also manufactured by Bombardier.

03 **LUXURY INTERIOR** of the LearJet.



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The world's aerospace industry, like other businesses, is facing a drop in revenues and higher costs. Moving operations to countries that offer lower labor costs is an option many in the industry are considering. However, technical skills, industry regulations and military contracts make it difficult for many aerospace companies to relocate their operations from the US, Canada or Europe. But Mexico, with its low costs and the drive to further educate an already well-trained work force, is becoming a viable place for many in the aerospace industry to relocate their production facilities. North of Mexico City, the growing city of Querétaro is becoming a key player in this effort.

The Bombardier – Queretaro alliance

Mexico's aerospace industry has about 125 companies, with most of them performing low skill jobs. The newest to fly in is Bombardier, which has landed in Querétaro.

But while most of these companies in Mexico tend to offer low skill jobs, Bom-

bardier, the world's third largest civil aircraft manufacturer, sees more potential in the country.

Bombardier believes Mexico's aerospace industry can develop and grow because of three key factors: infrastructure for a demanding industry; improved international aviation regulation; and a national education program for the industry.

Bombardier is investing 200 million usd in its new plant, where it is manufacturing electrical harnesses, structural aircraft components and composite fuselages for some of its new state-of-the-art aircraft.

Their investment is attracting other major suppliers to Querétaro, as well as to other regions such as the northern states of Baja California and Chihuahua. This is helping build up a large infrastructure for the industry.

In 2004, Mexico's industry entered into a certification program with the US, the Bilateral Aviation Safety Agreement (BASA). It allows for the production of aerospace components that can be sold on the international market.

Around the World

Mexican fleet has 7,200 aircraft: 1,400 commercial, 5,300 private and 435 official.

Expanding market in helicopters and executive jets.

84 airports (55 international)

All airports are operated by private companies

Mexico City airport has the largest operation.

Others important airports are: Toluca, Guadalajara, Monterrey and Tijuana.

The number of passengers in Mexican airports have a yearly growth of 6%.

Source: SCT/ASA



THREE KEY FACTORS

1) Infrastructure for a demanding industry; 2) Improved international aviation regulation; 3) A national education program for the industry

“67 Aerospace Companies, 10,000 Workers.”

While the education and training of workers involves the long term development of human capital, local and federal governments are strongly committed to making this happen as soon as possible.

An Aerospace Education Hub

The learning curve for producing aircraft parts is long and expensive, and manufacturing success depends largely on the quality of the work force. While Mexico already has many well-trained workers, particularly in the automotive industry, there have been no training programs focused on the aerospace industry. But Bombardier is doing its part to change that.

An agreement between the Canadian and the Mexican governments has created a partnership between Montréal Aerospace Trade School (EMAM) and the Querétaro Technical University (UTEQ). This partnership brought together EMAM's 30 years of experience and UTEQ's technical expertise, resulting in the training of the first 1,000 technicians for Bombardier facilities in Mexico.

This program is known as the Fast Track Training Program. It was developed for Bombardier by UTEQ and it aims to train workers in electrical and structural assemblies during a 16-week program (12 weeks of schooling, 4 weeks on the job training) in its first stage. Based on a school-factory concept, the training quickly provides knowledge and experience related to the manufacture of major parts rather than small sub-assemblies.

This partnership worked so well that Bom-

bardier moved up by two years its training program in Mexico. An aerospace school, the National Aeronautic College of Querétaro, is set to be launched in the next few years.

In the past, aircraft parts manufacturers took advantage of the location and the Mexican work force's technical knowledge, developed by different industries such as electronics or automotive. But Querétaro's alliance with Bombardier is developing a long term education program for advanced manufacturing processes that meet international standards. Moreover, this alliance is looking to develop the region as an aerospace cluster with workers that can design, manufacture and maintain complex aircraft components.

Future challenges

The Bombardier partnership is key if Mexico's aerospace industry is to succeed. However, other companies such as Cessna, Eaton, Goodrich and GE also have operations in Mexico, a sign that others recognize business conditions are right for this success.

There is huge potential for growth in an industry that has more than 22 billion USD in aircraft sales and is not expected to be immediately affected by the current worldwide economic crisis.

The next steps in the Mexican aerospace industry's development include: manufacturing engine parts in the cluster; developing complete maintenance and repair facilities in

different locations; and having sufficient critical mass to build a complete aircraft.

Education and training are critical for the success of this effort. Thus, Mexico's best universities will have to take an active role in this industry. UTEQ has paved the way, but substantial contributions are needed from others. The UNAM (Universidad Nacional Autónoma de México), IPN (Instituto Politécnico Nacional) and the ITESM (Instituto Tecnológico y de Estudios Superiores de Monterrey) must become key players in consolidating this business in Mexico.

The aerospace industry can be a sustainable business model for Mexico and all the factors for its success are there. Key players such as Bombardier are helping its development, needed infrastructure is in place or being created and successful education and training programs are enhancing an already skilled work force. Mexico's aerospace industry is ready to take off. And its next destination is: success.

Bombardier manufactures electrical harnesses, structural aircraft components and composite fuselages for airplanes in high demand within the commercial and business airline industry.

Bombardier Q400, CRJ 200 and the Global Express Aircraft (in order with the pictures) can fit from eight to 50 passengers. The CRJ 200 is a favorite of regional airlines because of its high efficiency and low cost. ■

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Advantages of Manufacturing in Mexico

Mexico has competitive advantages in metalmeccanic and electrical sectors, among others.

Lower operation cost.

Less expensive labor cost.

Highly qualified workers (65,000 new engineering majors a year).

Political and economic stability.

Proximity to US market.

NAFTA, no export and import duties

Protection of Intellectual Property Rights.

Fabrication Capacity

US companies working in Mexico in the last 3 years have found opportunities in the following components:

Turbines:

Rings machining, valves, electronics, filters, buckets, gears, shafts, air and fuel cooling lines and turbine maintenance.

Components of aircraft dashboards:

Harnesses, printed circuit boards and cabinets.

Other components:

Jigs and fixtures, and special heat treatments.

Fuselage:

Special paints, seats, carpets and other parts.

Manufacturing processes:

Forging, die cast, machining with 4 and 5 axes, stamping and plastic injection.

Source: Ministry of Economy

