SPECIAL REPORT

SAFRAN IN AMERICA

Civil and military aviation, security
By divesting our mobile phone business to a French investment firm last July, Safran is clearly refocusing on its core businesses. We can now devote our full attention to consolidating and building our positions in aerospace, defense and security.

This proactive strategy is reflected in two major agreements with our long-standing partner General Electric: one will extend our CFM International joint venture for another 30 years, while the second expands our equal partnership to include engine nacelles. These agreements symbolize the excellence of our transatlantic relations, which provide a decisive advantage in our markets.

At the same time, in Europe we bolstered our leadership position in the market for identification solutions with the acquisition of the Dutch company SDU-I, allowing us to offer a more comprehensive array of ID technologies.

The global economic environment is strained, to say the least, and that includes the aerospace industry. But over the last three decades air transport has grown twice as fast as the world economy, despite three major oil shocks. As a manufacturer, we have to deliver the technical and economic solutions needed, and not feel sorry for ourselves. I am sure that once again we will be able to overcome these difficulties by becoming even more competitive and innovative.

The Safran Group started down the international path a number of years ago. Our businesses in different regions of the world are growing, bringing us closer to customers and allowing us to take advantage of more advantageous cost structures. In this issue, Safran Magazine takes a closer look at both North America – already home to some 15% of our consolidated workforce – and China, which generates 15% of our aerospace sales.
GE AND SAFRAN RENEW PARTNERSHIP FOR ANOTHER 30 YEARS

At the Farnborough air show in July, GE Aviation and Snecma (Safran Group), parent companies of CFM International, signed an agreement that extends their 50/50 partnership to the year 2040, and expands it to include associated services. By extending their collaboration, the two partners are placing CFM on the path for long-term success in the market for single-aislejetliner engines.

“Our industry is in the midst of perhaps the most challenging times we have ever faced,” said Jean-Paul Herteman, Chief Executive Officer of Safran. “In the early 1970s, the GE/Snecma partnership brought customers the benefits of high bypass turbofan technology, reducing fuel burn by 20 percent compared to the low-bypass engines they replaced, while introducing a new standard in reliability. We are now in a position to bring that same magnitude of improvement to the industry for the next 30 years. CFM International will develop a new generation engine, LEAP-X, which by 2016 will reduce fuel burn by up to 16 percent compared to the current CFM56 Tech Insertion engines powering Airbus A320 and Boeing 737 family aircraft.

“The relationship between GE and Safran today is the strongest it has ever been,” said David Joyce, President and CEO of GE Aviation. “Together, through the LEAP-X engine, we are bringing an advanced suite of revolutionary technologies to market that will take the next generation of single-aisle aircraft to a whole new level of fuel efficiency, while also reducing NOx emissions, carbon emissions and noise. We understand the pressures the airlines are under. As we have in the past, we will deliver for the future.”

The two aircraft engine manufacturers signed the original agreement in 1974 and created CFM International as a 50/50 joint company. CFM International is by far the leading supplier of aircraft engines, delivering more than 18,500 CFM56 engines for commercial and military applications to nearly 500 operators around the globe to date.

GE AND SAFRAN TEAM UP ON NACELLES AND THRUST REVERSERS

GE Aviation and Safran announced an agreement at the Farnborough air show in July to create a joint venture for the development, production and support of engine nacelles for the next generation of single-aisle commercial jets. Aircelle and Middle River Aircraft Systems, subsidiaries of Safran and General Electric, respectively, will each own half of this new entity, which will address new business opportunities with all engine and aircraft manufacturers involved in the single-aisle jetliner category. The new joint venture builds on more than 35 years of partnership experience by General Electric and Safran, via CFM International, a textbook case of cross-border collaboration. The new joint venture will call on the existing design, development and production capabilities of Aircelle (Safran) and Middle River Aircraft Systems (GE). These two companies offer highly complementary engine nacelle product lines and technical expertise. It will also draw on General Electric’s and Safran’s deep knowledge of avionics, power electronics and actuation systems, all of which can be applied to engine nacelles for next-generation aircraft.

Sagem Défense Sécurité, long-standing partner to MBDA

On May 14, 2008, Sagem Défense Sécurité (Safran Group) signed a collaboration agreement with MBDA, the world’s leading manufacturer of missile systems, concerning the AASM modular air-to-ground weapon and infrared guidance for tactical missiles. In particular, MBDA France will be in charge of export sales of the AASM, developed by Sagem Défense Sécurité, thus providing comprehensive solutions that meet the needs of today’s armed forces. The agreement on infrared seekers extends a fifty-year collaboration between the two companies.

A HOST OF CONTRACTS FOR SNECMA SERVICES

Snecma Services (Safran Group) announced six CFM56 engine maintenance contracts during the Farnborough air show in July. Airlines from Russia, France and Tunisia opted for engine maintenance, repair and overhaul (MRO) services by Snecma Services, whose close ties to the engine manufacturer provide an edge in this competitive market. Snecma Services also signed an engineering support contract with Royal Air Maroc, the Moroccan flag carrier, involving the permanent remote monitoring of engine performance.
**SAFRAN REVAMPS ORGANIZATION**

The aviation sector is undergoing deep changes spurred by the imperative goal of developing less fuel-hungry aircraft, the increased role of system suppliers, with aircraft manufacturers focusing on their core business of systems integration, and customers’ growing demand for integrated services. Safran is revamping its organization to meet the needs of this changing market. Hispano-Suiza is creating the Safran Power division, consolidating the Group’s power electronics activities to stake out a position as the world leader in “more electric” aircraft technologies, a key to higher performance. At the same time, Hispano-Suiza’s engine control systems entity will be transferred to Snecma to reinforce the unity of aircraft engine development programs. Safran is revamping its organization to meet the needs of this changing market. Hispano-Suiza is creating the Safran Power division, consolidating the Group’s power electronics activities to stake out a position as the world leader in “more electric” aircraft technologies, a key to higher performance. At the same time, Hispano-Suiza’s engine control systems entity will be transferred to Snecma to reinforce the unity of aircraft engine development programs.

A new Safran Electronics division is being created as part of Safran Defense Sécurité, to strengthen unity in this critical area, and enhance the visibility of Safran’s broad expertise in electronics. The new division will count some 1,500 specialists from different Group companies. Snecma Services is merging with Snecma to create an optimized structure offering both new engines and associated support services. At corporate level, Safran is setting up a new business development division and a materials and processes division. All of these changes, pending consultation with labor organizations, are designed to provide solid foundations for the Group to meet the upcoming challenges in its fast-evolving sectors.

**SAFRAN ACQUIRES A SECURE PASSPORT PRODUCER**

On June 29, 2008, Safran acquired SDU-identification, a Dutch company specialized in the production of secure passports and ID documents. This addition will allow Sagem Sécurité (Safran Group) to offer a complete array of ID technologies, and take a leading role in the market for ID documents, which is headed for strong growth. Sagem Sécurité is already the world leader in biometric ID solutions, and an acknowledged specialist in secure electronic transactions, based on biometric and smart card technologies.

Since April 2008 Sagem Sécurité (Safran Group) has signed nearly a dozen contracts with governments in Africa, Europe and Asia. Sagem Sécurité offers state-of-the-art identity solutions, in particular its automated fingerprint identification system, or AFIS, chosen for example by the Côte d’Ivoire. The Safran Group company will supply systems and manage population and voter registration operations in conjunction with the Côte d’Ivoire’s National Institute of Statistics and Independent Electoral Board. Some 6,000 AFIS stations at 11,000 sites will be used to register citizens and update voting lists based on individual biometric data. Based on this list, Sagem Sécurité will then issue 11 million high-security ID smart cards, and 9 million voter cards.

Other contracts won by Sagem Sécurité will help solve criminal cases in Malaysia and Botswana, by analyzing fingerprints, and ensure the security of visas and passports in France and the United Kingdom.

**A400M ROLLOUT**

For its rollout in Seville, the new Airbus A400M military transport plane was welcomed by King Juan Carlos of Spain. The new plane has already booked 192 orders, and is scheduled to make its first flight in October. The A400M includes contributions from ten Safran companies. Safran, along with partners in Europrop International (EPI), is in charge of developing the TP400-D6 turboprop for this four-engine plane. Other Group companies are playing leading roles on the landing system, wiring and cockpit. The Airbus A400M is a multirole aircraft, providing troop and military equipment transportation, as well as medical evacuation (“medevac”). It can also handle low-altitude cargo drops.

Successful first flights for the Superjet 100

The new Superjet 100 regional jet produced by Sukhoi of Russia made a successful maiden flight on May 19 at Komsomolsk-on-Amur, Russia. Powered by twin SaM146 engines co-developed by Snecma (Safran Group) and NPO Saturn, this aircraft will be available in different versions carrying 75 to 95 passengers. Other Safran companies participating in this program are: Messier-Dowty, for the landing gear; Hispano-Suiza and Techspace Aero for engine equipment; Aircelle, Microturbo, Safrance and Technofan. With more than 100 orders already booked, the Superjet 100 will provide a breakthrough for Russia in the booming regional aviation market.
Clean Sky is a seven year research program,” notes Marc Ventre, chairman of the program’s management committee and also Executive Vice President of Safran, Aerospace Propulsion branch. “It’s based on an innovative public-private partnership, funded equally by industry and the European Commission. Clean Sky will help meet the ambitious objectives set by ACARE (Advisory Council on Aeronautics Research in Europe), especially reductions of 50 percent in CO₂ emissions, 80 percent in NOₓ emissions and 50 percent less noise for aircraft hitting the market in 2020, compared with 2000.”

Clean Sky is based on six major Integrated Technology Demonstrators (ITD): three concerning the aircraft itself (commercial jets, regional aircraft and helicopters), and three concerning cross-functional areas (engines, systems and eco-design). Technology demonstrators will be built and tested on the ground and in flight. There is also a “Technology Evaluator”, which will quantify the combined environmental impact of the technologies developed through the ITDs.

This program was developed by 12 European aviation companies, including Safran, Airbus, Thales and Rolls-Royce, which direct it in conjunction with the European Commission. More than 70 companies and organizations have been identified as “associate partners”. Additional partners will be invited to join the program based on proposals submitted over the next seven years.

A lead role for Safran
Safran is one of the leading participants in the Clean Sky program, with nearly all Group companies playing a role: Aircelle, Hispano-Suiza, Labinal, Messier-Bugatti, Messier-Dowty, Sofrance, Technofan, Snecma, and Techspace Aero, Turbomeca, Microturbo and Sagem Défense Sécurité. Safran is represented by ACARE for 2020 (see article opposite). Safran is represented by CEO Jean-Paul Herteman, who will be on the CORAC steering committee.

Clean Sky, officially launched on February 5, 2008.

**Clean Sky: Avigation Goes Green**

**VIEWPOINT**

**ROLAND KRAFFT, DEPUTY DIRECTOR OF R&T, SNECMA**

**Snecma: hard at work!**

Snecma is co-director of the engine ITD. What are you working on?

The engine ITD comprises five demonstrators, including one under our responsibility: the “open rotor” design, with counter-rotating low-pressure turbines directly driving non-shrouded propellers, or fans. Snecma has been working for many months on preliminary project studies. The overall architecture has been defined, but we still need to address a few critical technical points. Over the next year we will be designing several preliminary projects to determine the different advantages and disadvantages, before making our final technical choices.

Who is participating in the project?

Only about a dozen full-time equivalent staff at Snecma for the moment, but this could eventually rise to forty or so. The associate members in the ITD are gearing up as well; for instance Volvo and Avio are taking part in the design of turbine parts. We have also determined the work split with other Safran companies. Techspace Aero will be involved in the lubrication system, Aircelle will work on the nacelle (with Aermacchi), and Hispano-Suiza on the pitch trim electronics for the two propellers.

What’s the timetable for this program?

Our first milestone is the Preliminary Design Review, or PDR, when we “freeze” the technical concepts. This review will be held as from October 2009. A year later comes the Critical Design Review, enabling us to launch construction of the demonstrator in early 2011. The initial tests, covering about 50 hours on an open-air test cell, are slated for the first quarter of 2013. In addition to checking engine operation, one of the major aims of these tests is to assess its aerodynamic and especially acoustic performance – which is still the main difficulty in designing an open rotor type engine.

**FRANCE’S STRATEGIC ADVISORY BOARD FOR CIVIL AVIATION RESEARCH**

The French Minister for Ecology, Energy, Sustainable Development and Town and Country Planning has created the strategic advisory board for civil aviation research, or CORAC (Conseil stratégique pour la Recherche Aéronautique Civile). Players in the aviation sector agreed to create this organization at the Grenelle environmental summit meeting in 2007. CORAC was founded to define and implement the research actions and innovative technological solutions needed to meet the European environmental objectives set by ACARE for 2020 (see article opposite). Safran is represented by CEO Jean-Paul Herteman, who will be on the CORAC steering committee.

Techspace Aero, Turbomeca, Microturbo and Sagem Défense Sécurité. Safran is participating in all ITDs, and is co-director of the engine ITD. “Clean Sky is receiving 850 million euros from the European Commission, a sum matched by the industry partners in the program,” notes Valérie Guénon, head of European affairs at the Group’s Research & Technology division. “The entire budget is managed by a jointly-owned company under the authority of a management committee grouping the European Commission, industry and an observer representing the countries involved, who contribute the public funding. The Clean Sky program itself will have an executive director and a program team based in Brussels.”

**Work kicked off following the first meeting of the management committee on May 28 – and Clean Sky is now afloat for the next seven years.**
Safran's presence in North America primarily focuses on the aviation and security markets.
Over the last three years, the international civil aviation market has shown relatively good health, which has benefited all aircraft and equipment makers. But over and above the record-setting figures (2,800 mainline commercial jets sold in 2007), two major concerns have emerged: the subprime crisis in the United States, impacting credit availability, and especially skyrocketing oil prices, which have considerably increased airlines’ operating costs.

The U.S. Department of Defense is also feeling the effect of these developments, according to David Berteau, senior advisor and director of the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies (CSIS) in Washington, D.C.: “Each ten dollar increase in the price of a barrel of oil adds nearly one billion dollars to the DoD’s operating costs.” Already, the crisis has resulted in orders being cancelled or postponed.

This climate of deep uncertainty has yet to hit the business aviation market, which is governed by different economic rules. Clients in this market – large corporations, wealthy individuals, and fractional ownership users – continue to enjoy good economic health, and the market shows no sign of losing steam. However, North America’s traditional domination of this market is starting to slip. The region accounted for nearly half of all global orders in 2007, while it is still home to 70% of the global business aircraft fleet.

In the space market, upcoming transatlantic programs will undoubtedly offer excellent opportunities for companies in this sector.

**Hefty spending on defense and security**

The North American defense market, primarily driven by the Pentagon, has been at record levels since the beginning of the Iraq war. According to David Berteau, however, “Today, the question is what share of the overall budget should go to military spending, and how this amount should be allocated between research and procurement.”

The security market, which encompasses both services and high-tech products, seems to be more of a long-term proposition. The U.S. alone accounts for about 45% of the global security market, and annual growth is estimated at 8 to 10%. Today, the sector is well established, with a clear legal framework and growing awareness of its importance by multinational technology corporations.

One thing is sure: companies that have established a solid presence in the United States will be in the best position to meet global demand. The worldwide security market will undoubtedly follow the development path blazed by the United States, although lagging a few years behind.

**MEXICO AND CANADA: OTHER FACTORS**

- Mexico is a hefty market, as well as an impressive industrial base. Labor is skilled and relatively inexpensive, while this country of 110 million inhabitants offers a large domestic market, despite considerable social inequality. Like Washington, the Mexican federal government, its states and various legal institutions have expressed a growing requirement for identification and security systems.

- The Canadian market is more mature, but it has a highly developed aircraft industry, which offers excellent sales opportunities for equipment manufacturers.

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**VIEWPOINT**

**USA, still the leader in military markets**

The only market where the U.S. is the most important customer is the military market, both fixed-wing and rotorcraft. This, of course, explains why all European contractors want access to this healthy business.

Do you see any reason for a possible downturn in the booming bizjet market?

The economic downturn and high fuel prices do not seem to be affecting the top end of society. There are no rumors or hints of a business jet downturn, although there are some early indicators of a mild softening. Also, business jet demand is finally globalizing, insulating the market from the effects of the U.S. downturn.

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The Messier-Bugatti USA plant in Walton, Kentucky makes wheels and carbon brakes for the American market.

Messier-Bugatti USA expanded its new production unit in Walton, Kentucky in January 2008. Covering some 10,000 square meters (108,000 sq ft), the new building doubles the plant’s total floorspace. About 50 people are now working in this highly automated facility, which manufactures wheels and brake piston housings and handles final assembly of wheels and carbon brakes.

According to Patrick Haywood, CEO of Messier-Bugatti USA, “By increasing our production capacity, we can keep pace with the steady growth in our business, especially in the U.S. market and for Boeing, since we provide wheels and brakes for most of their current line of commercial jets.”

In addition to supplying wheels and carbon brakes for U.S. Air Force C-17 and KC-135 planes, Messier-Bugatti also offers these items on the longer-range Boeing 777 models, the 767-200/300 and the 787 Dreamliner, which will soon enter revenue service. In addition, Boeing now offers Messier-Bugatti carbon brakes on its 737 Next-Generation family.

“This new facility in Walton also allows us to add production capacity in the dollar zone, which helps offset the impact of the unfavorable dollar/euro exchange rate,” adds Haywood. “Messier-Bugatti now has 63 percent of the wheel and carbon brake market for mainline jets with more than 100 seats, and this new production unit will enable us to continue expanding our share of the market.”

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Long-term commitment

Safran companies continue to open new facilities to meet the production needs of major plane-makers in North America, such as Boeing, Hawker Beechcraft, Gulfstream and Bombardier: Sagem Avionics in Grand Prairie, Texas, Turbomeca Manufacturing in Monroe, North Carolina, and a new facility at the Messier-Bugatti USA plant in Walton, Kentucky.

Other facilities have been expanded, or will be shortly to cope with growing business volume: Turbomeca USA in Grand Prairie, and Labinal in Mexico, which is doubling the floorspace at its plant in Chihuahua and will add another 300 employees by the end of the year. Several engineers will join the Labinal design department.

“Our selection for the Boeing 787 should help us enhance our expert-
Because of its extensive partnerships and investments, Safran has become a major player in the aviation and security markets in North America.

**MARKETS.** Because of its extensive partnerships and investments, Safran has become a major player in the aviation and security markets in North America.

**SAFRAN, A NORTH AMERICAN MANUFACTURER.**

Nothing could better symbolize the collaboration between Safran and the United States than the exceptional success of the CFM56 engine, the fruit of over three decades of teamwork with General Electric through CFM International. Some 19,000 CFM56 engines have been sold to date, and they now power 7,000 aircraft. The CFM56 is today’s best-selling engine for mainline jets (over 100 seats), and more than 2,000 of these engines power U.S. military tankers and special-mission aircraft, making the U.S. Air Force CFM56’s leading customer.

“Safran enjoys excellent industrial credibility in North America,” says Emeric d’Arcimoles. “Our high-quality investments, commitment to growth, and careful development of production facilities go hand in hand with our reputation for professionalism and technical expertise. Safran has earned the respect of customers, employees and shareholders alike, because we meet our commitments.”

In 2005 Turbomeca won the reengining contract for the Coast Guard’s HH-65 helicopters, covering 225 Arriel 2C2 CG turboshaft engines.
FOREIGN INVESTMENTS, A KEY GROWTH FACTOR

Safran’s presence in the United States reflects a global trend towards investments in the world’s leading economy. “Foreign investment is a leading growth factor for the American economy,” said U.S. Assistant Secretary of Commerce David Bohigian when he visited the Messier-Bugatti plant in Walton, Kentucky for “Invest in America Week”. Despite a significant drop in foreign direct investment in the last 20 years, due to the emergence of new economies, the United States is still the leading destination for international investors. Nearly $200 billion was invested in the United States in 2007, twice as much as in China (including Hong Kong). “These foreign investors are primarily motivated by the size and energy of the domestic market, as well as by highly qualified local labor.” More than five million Americans work for foreign companies, and these international investors contribute some 15 percent of our R&D expenditures,” noted Bohigian. “These investments have a profound impact on the American industrial fabric, because 30 percent of the jobs they create are in the manufacturing sector, versus only 10 percent for the economy in general.”

International Development division

Safran contributes to American military programs, for instance as supplier of engines for T-45 Goshawk trainers and landing gear for F/A-18E/F fighters deployed by the U.S. Navy; engines for the U.S. Army’s UH-72A helicopters; and it also reengined the U.S. Coast Guard’s HH-65 helicopters.

Safran enjoys an equally prominent role in the North American civil aviation market, with its customer list including all major airplane and helicopter manufacturers: Boeing, Bombardier, Gulfstream, Cessna, Lockheed Martin, Sikorsky, American Eurocopter and Bell. Just about all airlines in North America call on the Group’s engines, nacelles, electronic power controllers, wiring, landing gear and braking systems.

Solid positions

Safran’s presence in the security market also goes back a long way, with the purchase 15 years ago of North American Morpho Systems, now Sagem Morpho (part of Group company Sagem Défense Sécurité). Reflecting this booming market, Safran has considerably expanded its operations, with a focus on fingerprint, facial and iris recognition and identification systems. “Security is a real growth market in the United States,” says Bernard Teychené. “Sagem Morpho enjoys an excellent reputation for its biometrics expertise, innovative products and service offerings.” This solid position has resulted in a growing number of contracts from governments and government agencies, including airports, the FBI, Department of Homeland Security, etc., as well as with SNSP (national public security system) of Mexico. For example, the FBI’s Fingerprint ID system stores more than 70 million fingerprints and provides identification in less than 20 minutes.

Along with this broad industrial presence, Safran’s operations in North America include research and training. For instance, Group companies have signed agreements with prestigious universities, such as Stanford and Virginia Tech, while French regional centers of aerospace excellence have formed partnerships with their North American counterparts.

“Our aim is to ensure the long-term presence of Safran in North America, by creating a real industrial hub with a network of local partners and suppliers,” concludes Teychené. “But Safran already has enough economic weight so that we are considered to be a major player in the North American aviation and security markets.”
AIRBUS A380: SAFRAN ON THE JOB

The world’s largest jetliner is now in service.
1. LANDING GEAR
Messier-Dowty designs, produces and tests the nose landing gear.

2. NACELLES
Aircelle provides the nacelles for both engines offered on this plane, the GP7200 and the Trent 900 (shown here during assembly at Toulouse).

3. ELECTRICAL ACTUATION SYSTEM
The electrical thrust reverser actuation system (ETRAS®) for both engines is made by Hispano-Suiza in partnership with Honeywell.

4. ENGINES
Snecma is responsible for most of the high-pressure compressor of the GP7200, giving it 10% of this engine.

5. BRAKING
Messier-Bugatti supplies five braking-related systems on the Airbus A380.

6. ENGINES
Belgian subsidiary Techspace Aero is in charge of the low-pressure compressor on the GP7200, giving it 7.5% of this engine.

TEN SAFRAN COMPANIES ON THE A380
The new Airbus super-jumbo jet entered revenue service nearly a year ago. Carrying up to 800 passengers, it had to incorporate state-of-the-art technologies to deliver reliability, performance and safety. Ten Safran companies contribute to this aircraft, in particular for the GP7200 engines, nacelles and thrust reversers, wiring, landing systems and the flight deck. A total of 202 A380s have been ordered to date, and should be delivered over the next five years.

For a complete list of all Safran systems and equipment on the A380, see www.safran-group.com, in Aircraft Applications.
SUCCESS. Starting in mid-2008, Boeing is offering carbon brakes on all Next-Generation 737 twinjets, whether new or already in service. Lighter and longer lasting than conventional steel brakes, Messier-Bugatti carbon brakes are now the brake of choice on all mainline commercial jets.

WORLD FIRST: CARBON BRAKES FOR THE NEXT-GENERATION 737 FAMILY!

The Boeing 737 twinjet, the world’s best-selling commercial airliner, was the last current-generation aircraft still being fitted with steel brakes. Safran company Messier-Bugatti was chosen by the American planemaker to provide wheels and carbon brakes for the entire Boeing Next-Generation 737 family: 737-600, -700, -800, -900, and -900ER. The market is huge, since there were more than 2,300 Boeing Next-Generation 737s in service at January 1, 2008, and another 2,300 on order!

“Our success reflects long-standing teamwork with Boeing. Since our original selection on the 767-200/300, Boeing has become increasingly confident in our relationship and our products, and that spurred them to open a new competition for the supply of carbon brakes on the Next-Generation 737 family,” says François Tarel, head of the Wheels and Brakes unit at Messier-Bugatti. French aircraft braking specialist Messier-Bugatti won this contract, and has already passed the different stages in the certification process. “Our brake is now in the Boeing catalog and airlines can select them for their Next-Generation 737 twinjets,” adds Tarel.

Enhanced braking
Carbon brakes offer significant advantages over their steel counterparts. On a 737-class aircraft, they provide weight savings of 320 kilos, which translates into lower fuel consumption. Furthermore, they ensure greater energy absorption, and double the endurance, with more than 2,000 landings per overhaul (LPO) guaranteed for the carbon brakes on the Next-Generation 737.

“We’re offering the same brake for all models in the Next-Generation 737 family,” explains Luc Favre-Duboz, program director at Messier-Bugatti. “That means a more efficient supply chain and reduced inventories for airlines.”

All of these advantages significantly reduce the airlines’ direct operating costs (DOCS), while the cost of the carbon brakes themselves is very competitive with conventional steel brakes. In fact, airlines are billed for Messier-Bugatti’s overhaul services according to the actual number of landings. Messier-Bugatti: Outstanding success on NG 737

Messier-Bugatti already holds 43% of the carbon brake market for commercial jets with over 100 seats, equaling some 3,500 aircraft in service. With this latest selection, Messier-Bugatti will further consolidate its position, and hopes to be chosen on at least half of all Boeing Next-Generation 737 jets rolling off the assembly line. Messier-Bugatti is currently the only carbon brake supplier certified by Boeing. It is also targeting carbon brake retrofits for at least several hundred aircraft already in service.

Production of Next-Generation 737 brakes has already kicked off at the Molsheim plant in eastern France, and in 2009 it will shift to the United States, at the Messier-Bugatti USA facility in Kentucky, near the Cincinnati international airport in Ohio.

Viewpoint

Jean-Christophe Corde
Chairman and CEO of Messier-Bugatti

“Starting this summer, Messier-Bugatti is offering its carbon brakes to airlines, in line with Boeing’s commitment to its customers. This technology is now used on all mainline commercial jets. On the Next-Generation 737, it will provide annual fuel savings of about $50,000, not to mention a reduction in CO2 emissions. Throughout the life of the program, this contract should be worth approximately $3 billion to Messier-Bugatti.”

Interview

John Hamilton,
Boeing 737 Chief Project Engineer

Lighter brakes

Why did you decide to fit carbon brakes by Messier-Bugatti on the Next-Generation 737?

Boeing decided to offer carbon brakes on this plane because they’re lighter than steel brakes. That means lower operating costs and fuel consumption, and therefore reduced emissions. Messier-Bugatti was one of two companies that submitted carbon brakes for testing, and these were the brakes that passed Boeing’s certification tests.

Why was the Boeing Next-Generation 737 one of the last airplanes still using steel brakes?

We offered steel brakes as standard equipment on the Next-Generation 737 because operators needed brakes that cooled down quickly for faster turnaround between flights. But progress in carbon brake technology ensured a faster cool down, so Boeing decided to reconsider its position for this family of aircraft.
Safran's products and technologies are perfectly in tune with development trends in Chinese industry, especially for commercial jets, helicopters and security applications. Today, some 60% of the mainline jets (over 100 seats) operating in China are powered by CFM56 engines, making a total fleet of 1,500 in China are powered by CFM56 engines, making a total fleet of 1,500. Some 60% of these aircraft use landing gear by Messier-Dowty and/or braking systems by Messier-Bugatti, both Safran companies of course. Fellow Group systems by Messier-Dowty and/or braking systems by Messier-Bugatti, both Safran companies of course. Fellow Group companies opened four new facilities in the country.

Four new facilities
Safran continues to expand its local operating base, reflecting its commitment to sustaining its role as a key partner to Chinese industry. Earlier this year Group companies opened four new plants in the country. “The Snecma Suzhou plant will produce some 700 low-pressure turbine shafts for CFM56-5B and -7B engines within four years,” notes Marc Ventre, Executive Vice President of Safran and head of the Aerospace Propulsion branch. “With the opening of Messier-Dowty Suzhou, a facility that makes landing gear parts for the Boeing 787, Airbus A320 and Dassault Falcon bizjet, our two sites in the country now span some 17,000 square meters of floor space,” says Yves Leclère, Executive Vice President, Aircraft Equipment branch. Snecma Xinyi Airfoil Castings in Guiyang, a joint venture with AVIC, makes castings for CFM56 engines. And Beijing Turbomeca Changkong Aero-Engine Control Equipment assembles and tests hydromechanical assemblies for engines made by Turbomeca and Beijing Changkong.

Local production
Safran’s presence in China reflects corporate strategy, especially since it is increasingly calling on local companies to produce critical parts for the global aviation industry. Twelve AVIC factories already make parts for the Group’s airplane and helicopter engines. These activities will generate sales of $88 million in 2008, a figure that should exceed $150 million by 2010. “China is now the leading customer for our civil aviation products, but for us it is also an increasingly important source of world-class production, under conditions that are carefully controlled and mutually beneficial,” says Jean-Paul Herteman, CEO of Safran.

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In addition, Safran has carved out some 17,000 square meters of floor space,” says Yves Leclère, Executive Vice President, Aircraft Equipment branch. Snecma Xinyi Airfoil Castings in Guiyang, a joint venture with AVIC, makes castings for CFM56 engines. And Beijing Turbomeca Changkong Aero-Engine Control Equipment assembles and tests hydromechanical assemblies for engines made by Turbomeca and Beijing Changkong.

The Snecma Suzhou plant will produce some 700 low-pressure turbine shafts for CFM56-5B and -7B engines within four years,” notes Marc Ventre, Executive Vice President of Safran and head of the Aerospace Propulsion branch. “With the opening of Messier-Dowty Suzhou, a facility that makes landing gear parts for the Boeing 787, Airbus A320 and Dassault Falcon bizjet, our two sites in the country now span some 17,000 square meters of floor space,” says Yves Leclère, Executive Vice President, Aircraft Equipment branch. Snecma Xinyi Airfoil Castings in Guiyang, a joint venture with AVIC, makes castings for CFM56 engines. And Beijing Turbomeca Changkong Aero-Engine Control Equipment assembles and tests hydromechanical assemblies for engines made by Turbomeca and Beijing Changkong.

In addition, Safran has carved out positions in several defense and security markets, including identification systems, lottery terminals and biometric terminals. For example, it has supplied several hundred fingerprint readers for the automated border control system between the Shenzhen Zone and the Hong Kong territories.

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A number of advances in current aircraft technology concern the cockpit. Visual flight and conventional instruments have given way to digital systems and intuitive displays, greatly simplifying the pilot’s job and making him safer and more comfortable. Sagem Avionics, a subsidiary of Sagem Défense Sécurité (Safran Group), is garnering international recognition through its complete range of integrated cockpit display systems (ICdS), which can be fitted to new aircraft, or retrofitted to aircraft already in service with older-generation instruments.

“Our ICdS systems are very attractive to potential clients, especially in the retrofit market,” says Thierry Sieg, sales & marketing manager at Sagem défense Sécurité. “For example, we are offering a ‘Glass Cockpit’ for helicopter modernization, including one to six ICdS multifunction displays, measuring 10, 8 or 6 inches diagonally. These displays can show several types of information, from engine parameters to navigation aids, as well as digital imagery captured by external sensors or synthetic vision systems. A single screen can also combine the simultaneous display of flight instruments and video images – an ideal solution for single-pilot machines, a market segment that is growing rapidly.”

The booming retrofit market

“Buyers of new helicopters have to wait a long time for delivery,” explains Jean Baudin, Chairman and CEO of Sagem Avionics. “Another way of meeting this growing demand is to upgrade older aircraft – and that’s where we come in!”

Over the next ten years, the helicopter cockpit retrofit market alone is estimated at several thousand machines. Sagem Avionics, for instance, is already in charge of modernizing a dozen AS350B2 AStar helicopters for the Los Angeles Police Department (LAPD). Another major contract concerns the supply of systems for 36 EC120 helicopters, in conjunction with Hélicoptères, a company in charge of training helicopter pilots for the French armed forces, through the army aviation school at Dax in southwest France.

For fixed-wing aircraft, Sagem Avionics is handling the retrofit of the twin-engine EMB-121 Xingu deployed by the air force and navy air transport school at the Avord air base, on behalf of EADS Socata. Sagem Avionics has also signed an agreement to modernize Gulfstream GII business twin-jets, a major contract for which the Supplemental Type Certificate (STC) is expected shortly.

Sagem Avionics now offers ICDS-based retrofit solutions for a number of different helicopters: Robinson R-44, Eurocopter EC120 and AS350, Bell 205 and 407, AgustaWestland AW139, Sikorsky S-61 and S-64. “We expect Sagem Avionics to take a significant share of this retrofit market,” says Jean Baudin.

Modern, dependable solutions

“Today’s digital instruments are more reliable and need less maintenance,” according to Thierry Sieg. “That’s the real advantage of our ICDS solution.” For example a static memory unit can record about 50 parameters, which can later be read on a computer or even directly on the cockpit displays. This means, for instance, that an overspeed indication missed by the pilot can be detected on the recordings. It’s also possible to carry out troubleshooting on the ground, by displaying sensor readings in real time: this is one of the advantages of a real multifunction control display unit, or MCdU.

Another advantage offered by the ICDS is flexibility: users can access different pages with a simple click. A button can also be installed on the pitch control lever, allowing the pilot to change display screens without letting go of the controls. The size and color of the engine instruments represented on the displays can be changed, and the display can be vertical or horizontal, depending on the initial configuration of the instrument panel. In short, Sagem Avionics offers a full array of cockpit solutions for the 21st century.
AIRPORTS SAFER, enhance security, while speeding up innovative solutions that will further boarding. Sagem Sécurité has developed who have to wait in several lines before the exit door opens. If there is an anomaly, the passenger is requested to go to the manual security area by returning through the entrance door. In service since 2006, this system now has over 200,000 registered users, all volunteers.

Sagem Sécurité is also deploying a similar system at all Australian international airports, including Sydney, Cairns, Brisbane, etc. The operating principle is based on facial recognition technology, using the photo embedded in a chip on passports. At Paris-Charles-de-Gaulle airport in France, Sagem Sécurité has successfully installed a pilot border control system, dubbed Pégase, based on fingerprint recognition. It will shortly be replaced by the Parafes system, which will be deployed at all international airports in France. In Egypt, Sagem Sécurité has delivered the latest version of its single passenger control gate, based on fingerprint recognition, for Terminal 3 at the Cairo airport.

Furthermore, Sagem Sécurité is playing a major role in setting up a biometric visa system in France. This is a two-part process, as explained by François-Xavier Fraisse, director of this program at the company: “Travelers’ fingerprints are registered when they request a visa at the French consulate in their country. On arriving in France, they submit their fingerprints once more to the border control staff, who immediately compare them to the originals.” More than 200 French consulates will be equipped with this system by the middle of next year. It employs very sophisticated biometric and computer technologies to make it easy to use. Dubbed Visabio, this system was designed to meet the heavy traffic requirements at modern international airports.

Having proved its efficiency, the Visabio concept will be extended through the biometric passport and visa program now being deployed in Europe. Fitted with a chip containing a digital image of the face and fingerprints, these new passports would increase wait times if they were processed using traditional manual methods. That’s why most large airports will soon be fitted with automated systems similar to those installed by Sagem Sécurité in the United Kingdom and Australia.
Safran announced the divestment of its mobile phone business in July 2008. It signed an agreement with Sofinnova, leading to the creation of a new company staking out a position as ODM (original design manufacturer).

A NEW FUTURE FOR MOBILE PHONES

On July 30, 2008, Safran signed the formal agreement with Sofinnova, a leading French venture capital firm specialized in high technology investments.

Once negotiations with labor organizations are completed, this agreement will lead to the creation of the company Sagem Wireless, based on Safran’s current mobile phone business. Safran will retain a 10% stake in the new company, which will be a specialized ODM (original design manufacturer), offering telephones to be sold under other brands and on behalf of other companies.

Sagem Mobiles has for instance developed phones to be sold under brands such as Porsche Design, Façonnable, Lulu Castagnette, Oxbow and Roland-Garros. These projects should grow even faster within the scope of the new company.

ODM strategy for Sagem Wireless

In its ODM agreements, Sagem Mobiles seeks to offer its partners a high-quality product with a distinctive difference, tailored to the specific requirements of our partners and customers.

The merger will give rise to a major French company specializing in mobile phones, Sagem with Vodafone, an operator for which it already does with Sony Ericsson. This type of partnership is to be able to reduce the number of compressor stages to only five, making it lighter, simpler, smaller, more robust and less expensive. We called on Turbomeca’s expertise in centrifugal compressor technology, and we are currently preparing for the high-pressure compressor.

SILVERCREST CORE DEMONSTRATOR TESTS A SUCCESS

Safran announced on September 25, 2008, the successful completion of testing for the Silvercrest engine core, the initial phase of the engine project, paving the way for program launch in 2009.

DEVELOPMENT. Sncma has passed a development milestone in the Silvercrest business jet engine project, paving the way for program launch in 2009.

The Silvercrest engine core (high-pressure section) demonstrator underwent a series of tests from November 2007 to March 2008, marking a development milestone for the engine project, paving the way for program launch in 2009.

The Silvercrest program could be launched in 2009, as soon as it is selected by an aircraft manufacturer for an initial application.

THE BOOMING BIZJET MARKET

According to the General Aviation Manufacturers Association, annual production of business aircraft jumped from 518 in 2003 to 1,138 in 2007. Current projections are for 31,000 new business jets to be produced over the next twenty years, without counting the relatively new “very light jet” category. No less than 63,000 engines, worth some $100 billion, will be needed to power these aircraft.

Demand for new business aircraft continues to grow, especially outside the traditionally dominant US market.
A critical decision on an upgrade for Europe’s Ariane 5 launcher will be made at the end of the year. This decision will also be decisive for Snecma, since it involves the resumption of development of the Vinci cryogenic engine for the launcher’s new upper stage.

VINCI: POWERING ARIANE 5 INTO THE FUTURE

Europe must absolutely maintain its independent access to space,” affirms Jean-Paul Herteman, Chief Executive Officer of Safran, “and that depends on continuing our strong position in the commercial launch market. Ariane has to maintain its leadership, and the global space industry should realize that Europe is committed to maintaining this position.” Europe’s space ministers will meet once again in November 2008, and decide on the programs that will allow Ariane 5 to continue on the success path. The key question concerns the resumption of development of a new cryogenic upper stage for the launcher, to be powered by the Vinci engine built by Snecma, a Safran Group company.

The development program for the Vinci cryogenic rocket engine was originally launched by the European Space Agency (ESA) in 1999, with Snecma as prime contractor. Safran and its European partners must meet two vital challenges: deliver top-flight performance and submit a proposal offering terms that will ensure the competitiveness of Ariane 5 launches. According to studies by ESA, the average weight of satellites is increasing about 125 kilos a year. “For a commercial launcher like Ariane 5, which boosts two satellites at a time, its payload capacity therefore has to increase about 250 kilos a year,” explains Jacques Serré, head of Snecma’s Space Engines division. “By 2015, according to launch operator Arianespace, Ariane 5 will have to be capable of carrying an additional 1,200 kilos in payload.”

In other words, a development program is necessary to upgrade the Ariane 5 launcher and make sure it remains competitive. Furthermore, the advent of electric propulsion systems on satellites (plasma thrusters in particular) could generate demand for new launch strategies. Launchers will have to be able to restart once they’re in the usual geostationary transfer orbit to reach higher orbits, even directly injecting satellites into geostationary orbit. A restartable engine is therefore imperative – and the HMTB engine currently used on the Ariane 5 ECA upper stage does not offer this capability. Snecma is therefore developing the new Vinci engine, designed from the ground up to be restarted in flight.

Conclusive tests

“We are halfway through the development program,” according to Jacques Serré. “All subsystems have undergone development tests, including the combustion chamber, the turbopumps and the valves, which are supplied by Techpace Aero, a group company.” Thirty-two tests of the oxygen and hydrogen turbopumps have been carried out at Snecma’s Vernon site, west of Paris, using a test rig originally designed for the Vulcain engine, modified for these turbopumps. The hydrogen turbopump built by Snecma operates at 100,000 rpm, and develops nearly 3 megawatts of power.

“We have already logged 4,671 seconds of testing on three engines,” says Christian Ferrantino, Vinci program manager at Snecma, “and that includes 2,200 seconds on a single engine, equal to three times its normal operating time.” Results are in line with forecasts, and augur well for the continued trouble-free development of this engine.

These tests also included conclusive tests of the engine’s restartability. Of course, these tests were carried out on the ground, while the engine restarts will take place in the zero-gravity and vacuum environment of space. The test rig can simulate the vacuum, but not the microgravity. Snecma therefore launched a large-scale program to develop applications that will simulate the behavior of propellants in microgravity.

To further improve its performance in vacuum, the Vinci engine features an extendible nozzle of composite materials – a first in Europe. Built by fellow Group company Snecma Propulsion Solide, the nozzle is stored in retracted position around the engine during the initial launch phase, thus allowing the use of a shorter upper stage for reduced weight. After the main stage has been jettisoned, the nozzle is extended before the engine is ignited.

“Once the decision is made in November, we will start a new development phase, including extensive testing and production engineering to ensure in-flight reliability,” notes Jacques Serré. “Our aim is to be flight-ready by 2016.”

A STRATEGIC ENGINE

The Vinci upper stage engine will enable Ariane to carry new-generation satellites because of its capability for multiple restarts. Offering higher thrust than its predecessor (about 40,000 lb), Vinci is the ideal engine for the next upgrade to Ariane 5. Europe’s launcher will have all the assets needed to stand out in a market characterized by increasingly fierce competition from launchers built in the United States, Russia, Japan, India and China. In addition to traditional launches into Earth orbit, Vinci will also enable Europe to play a leading role in a major international scientific exploration program, such as the one recommended by French President Nicolas Sarkozy during his speech at the space center in Kourou, French Guiana last February. Vinci will double Ariane 5’s payload capacity to the Moon (2,300 kg), or to Mars (4,000 kg), for scientific equipment, exploration vehicles, or supplies for a manned base (a Mars mission would take about 500 days). The increased payload capacity of Ariane 5 would also make it possible to place a spacecraft in orbit around Mars, and carry sufficient mass to support a sample return mission. Last, but certainly not least, Vinci could easily be adapted for applications other than Ariane 5, for instance on the upper stages in next-generation launchers, or for tomorrow’s orbital vehicles.
safran is a superb racing machine,” enthuses skipper Marc Guillemot. “It’s turned out to be a very successful boat from all angles. People throughout Safran are highly motivated and I can feel that they’re behind us 100 percent!” For both Marc Guillemot and the Group, the upcoming Vendée Globe race will be the culmination of a partnership that started back in 2005.

One of the main reasons behind Safran’s decision to sponsor an ocean racing yacht was the cultural and technical similarity between the aerospace and naval construction sectors. Safran is not just a sponsor, but a veritable partner who makes a significant technological contribution to the program. For Safran, the Vendée Globe race is the ultimate full-scale trial.

“The boat enabled us to develop new technologies, but still within the scope of Safran’s core businesses,” explains Pascal Chadail, head of the boat sponsorship project at Safran. One of the most striking is a UFO detector – that’s unidentified floating objects, which are the bane of all skippers, whether icebergs, marine mammals or stray containers. Calling on optronic systems, an area in which Group company Sagem Défense Sécurité is a European leader, the detector, based on an infrared camera, was tested at sea during The Artemis Transat* race from England to the United States (Plymouth to Boston) last May. This system could eventually find a substantial market around the world.

Another example of Sagem Defense Sécurité’s involvement is the development of special shipborne lithium-ion rechargeable batteries, in conjunction with Leclanché. These batteries replace the far heavier batteries that were traditionally used to power onboard systems (and had to be recharged by a large alternator). A lithium-ion battery uses lithium in the form of ions, instead of as a metal, and for a given weight stores twice as much energy as the usual nickel metal hydride (Ni-MH) batteries, or four times as much as a classic lead storage battery. “We achieved weight savings of more than a hundred kilos compared to a lead battery,” says Chadail. “The Li-Ion battery has already been tested on four transatlantic crossings, and we’re very satisfied with its performance.”

3D weaving

Safran’s expertise is also reflected in a new 3D method for weaving carbon fibers. This technology is already used by Snecma (Safran Group) to fabricate fan blades for aircraft engines, and by fellow group company Messier-Dowty for the strut on the Boeing 787 Dreamliner’s landing gear. Composite materials made with this weaving method offer a high level of precision in producing the exact thickness of the part, from a few millimeters to several centimeters. This advanced fabrication method has another, indirect advantage. When the high-tech Safran boat detects a shock it automatically raises its rudder to make sure it doesn’t break. But any shock still leaves a mark, and over time a conventional composite material will gradually delaminate, starting at the impact point. “This is not very important on a Transat race lasting a couple days,” explains Pascal Chadail, “but on a round-the-world race lasting three months, the woven 3D method, which is more shock resistant, gives us higher reliability. In other words the woven structure, with its warp and weft, does not fall apart. That would really be the ultimate irony, if the Safran’s ‘safran’ – the French word for ‘rudder’ – had the slightest problem!”

May 26, 2008: Marc Guillemot arrives in Boston, finishing fourth in The Artemis Transat.* The Artemis Transat, which the French had previously dubbed the “English Transat”, is the oldest solo transatlantic race, starting in 1960.
O ur commitment to meeting both social and cultural needs is already reflected in the Group’s two foundations,” explains Françoise Descheemaeker, director of patronage programs at Safran. The Safran Foundation for integration combats all forms of social exclusion and supports the integration of disabled young adults, whether physical, mental or social disabilities. The Safran Foundation for music supports talented young musicians both at school and as they start their careers. For example, this foundation contributed to the career development of young pianist David Greilhammer, named “discovery of the year” in the instrumental soloist category at the 2008 Victoires de la Musique Classique classical music awards. Working outside the scope of its two foundations, Safran supported the Solidarity concert series organized by the Musiciens de la Prée, an initiative that in fact combined its social and cultural commitments — two areas that are often mutually exclusive. The orchestra calls on a pool of about 50 talented young musicians from Europe’s leading conservatories, and has developed a very unique approach. For instance, it organizes the “Seasons of Solidarity” series to support humanitarian actions, with four concerts a year.

In concert for research

With Safran as a new partner, the orchestra organized a special Autumn 2007 concert to support a national campaign for brain research on degenerative neurological diseases. Held at the Gaveau concert hall in Paris, this concert raised public awareness of these diseases, while donating all receipts to the Neurodon association to finance a research grant.

Along the same lines, a Spring concert supported the European Leukodystrophy Association (ELA). Other concerts will follow this coming Autumn for the association “Aviation without Borders”, and in the winter for “Fondation d’Auteuil”, a foundation for disadvantaged youths. Safran’s partnership with Musiciens de la Prée is not limited to the Seasons of Solidarity concerts. In March 2008, the agreement was extended to a third partner, the French Ministry of Education. More than 800 junior high school students from disadvantaged areas in Paris, Créteil and Versailles were invited to Gaveau for a concert that won unanimous praise. As Françoise Descheemaeker notes, “For those who are excluded from society, opening the door to culture is one of the best ways of encouraging integration and a drive to succeed.”

INTERVIEW

PEJMAMEMARZADEH, CONDUCTOR OF THE MUSICIENS DE LA PRÉE ORCHESTRA

“Through music we form ties between the public and humanitarian actions”

What was behind the creation of the Musiciens de la Prée association?

The creation of this orchestra reflects two objectives. First, of course, the music itself, through a total commitment to establishing our ensemble as a top-flight orchestra. But it also reflects our desire for music to help people on two levels: by expressing solidarity, especially through the Seasons of Solidarity concert series, and by fostering a dialog between East and West.

How is the Seasons of Solidarity series organized, and has it been successful?

We regularly organize concerts at the Gaveau concert hall in Paris to support humanitarian actions. These are moments of musical pleasure of course, but also moral and even financial support, since we donate all receipts. We have already given nine concerts, attended by more than 5,000 people, allowing us to donate some 240,000 euros to various associations.

Would you say that the orchestra is like a small business?

Yes, in fact it is: we have four permanent employees and a very dynamic board of directors. That also means we have been able to deploy various development initiatives. For instance, we recently started a “friends of the association” club, to recognize and encourage the loyalty of our most faithful supporters.

SOLIDARITY. By forming a long-term partnership with the “Musiciens de la Prée” orchestra, Safran illustrates one of the defining characteristics of its patronage strategy, namely a commitment to creating links between its social and cultural commitments.

SAFRAN PATRONAGE: AT THE CROSSROADS OF SOCIAL AND CULTURAL COMMITMENTS
Air France will have “turned over” 227 short and medium-haul jetliners, 157 long-haul jetliners and 40 freighters – more than double the size of its average fleet over this period. This focus on renewal has never lagged, even during the downturn of 2001-2003.

Today, Air France boasts one of the world’s youngest long-haul fleets – and it intends to keep adapting it to match market requirements. In this interview, Pierre Vellay, Senior Vice President, New Aircraft and Corporate Fleet Planning, Air France, explains.

Air France currently operates a fleet of slightly over 400 airplanes, including 134 regional aircraft (Embraer, Canadair Jet, Fokker, etc.) deployed by several regional subsidiaries; 131 short/medium-haul single-aisle twinjets, all from the Airbus A320 family; and 97 long-haul widebody jetliners: Boeing 747-400, 777-200/300, and Airbus A340-300 and A330-200. In addition, it operates about a dozen Boeing 747-400 freighters, although half of total freight is actually carried by its passenger planes.

Fleet renewal
Air France applies a highly proactive policy of fleet renewal and rationalization. Between 1998 and 2012, Air France will have “turned over” 227 short and medium-haul jetliners, 157 long-haul jetliners and 40 freighters – more than double the size of its average fleet over this period. This focus on renewal has never lagged, even during the downturn of 2001-2003.

Today, Air France boasts one of the world’s youngest long-haul fleets – and it intends to keep adapting it to match market requirements. In this interview, Pierre Vellay, Senior Vice President, New Aircraft and Corporate Fleet Planning at Air France, sheds light on what airlines today expect from aircraft and equipment manufacturers.

Airlines and equipment manufacturers: joint objectives

New aircraft and new engines, energy, financial and environmental budgets, advanced technologies….. Airlines expect a lot from the aircraft industry, as Pierre Vellay, Senior Vice President, New Aircraft and Corporate Fleet Planning, Air France, explains.
In fact, we’re also eager for the -900 capacity jetliners like the A380. Of the major advantages of large- And the challenge has become increasingly fierce competition. low-cost carriers are providing segments, high-speed trains and In the domestic and medium-haul introduction of the airbus a380- saFran
Because our growth magazine saFran
Why is the important for air France? the A320 entered service in 1988, been significantly improved since While the aircraft and engines have half of our medium-haul fleet. the airbus a320. Why is this so
You are pressuring aircraft and engine manufacturers to replace the airbus A320. Why is this so important for Air France? Today, we plan to replace about half of our medium-haul fleet. While the aircraft and engines have been significantly improved since the A320 entered service in 1988, these advances did not concern energy aspects. Our top priorities were reliability, on-time performance and maintenance costs, since fuel was a relatively small part of total operating costs – but this is no longer the case. While “emerging” airlines need airplanes to meet their growth requirements, traditional carriers such as Air France focus more on fleet replacement. For us, this capital investment is only justified if we can cut operating costs by 16 to 18 percent. Demand in the 80 to 240 seat segment will in fact be redistributed, because renewal of our short and medium-haul fleets will not
be limited to replacing aircraft in the airbus A320 and Boeing 737 families. We need aircraft with more than 220 seats, but also 80 to 100-seat aircraft offering far higher performance than the current generation. And of course a single aircraft and engine can not cover all of these needs.

What are the main technological challenges facing the civil aviation industry? From the standpoint of aircraft and their intrinsic performance capabilities, we have to reconcile economic-energy challenges with environmental challenges. That naturally implies several tradeoffs – what I call “contradiction management” – to ensure the best combination of aircraft performance, consumption, noise and emissions. We would like to see the next generation of aircraft and engines developed concurrently, to capitalize on optimum design synergies. There have been continuous advances in design and aerodynamics, which should also have an impact on noise; people generally don’t realize that the main source of noise when an aircraft lands is not the engines, but the landing gear! As far as aircraft weight is concerned, the question we are now asking is whether carbon composite technology – initially developed for the Boeing 787 and the airbus A350, and soon to be applied to larger aircraft – could also be used on aircraft with smaller diameter fuselages. Concerning aircraft systems, all aspects of system architecture and power electronics are now under control, but we’re not as advanced on the “infotainment” (information and entertainment) aspects; digital multimedia technologies are evolving much faster than aircraft, and the resulting gap is a problem since this equipment makes it harder to reconfigure our cabins. In addition, everything to do with aircraft operations – air traffic management, air traffic control – represents considerable technological challenges. We have to make significant progress if we are to improve the procedures for climb and descent, taxing, routing, cruise levels, etc.

What kind of relationship do you have with the engine-makers? Engine-makers are not like other equipment manufacturers. We stay in close touch with them, whether it’s to talk about product performance and durability, or service quality – especially for maintenance, repair and overhaul, or MRO. Furthermore, engine-makers apply a different business model than other companies in the industry. When we purchase a spare part, an engine or services, we are reimbursing the engine-maker’s contribution to the initial pre-financing for purchase of the aircraft.

There’s another, very important aspect of our relationship with engine manufacturers: we seek a medium and long-term view of the “threshold effects”, by which I mean the financial feasibility of upcoming technological and industrial breakthroughs or disruptive technologies. This implies a climate of mutual confidence: the engine-maker has to be able to support a new engine program without giving the impression of degrading previous models, which would impact the residual value of our assets. So we count on engine-makers to share our assessment of asset valuations as technologies change.

Safran Magazine: Why is the introduction of the Airbus A380-800 so urgent for you? Pierre Velay: Because our growth is driven by long-haul service. In the domestic and medium-haul segments, high-speed trains and low-cost carriers are providing increasingly fierce competition. And the challenge has become more critical these days: given the skyrocketing price of jet fuel, we have to focus on our unit costs (per passenger), which is one of the major advantages of large-capacity jetliners like the A380. In fact, we’re also eager for the -900 version, not only because it’s even larger, but because we’re expecting a new generation of engines that will enhance overall performance.

You are pressuring aircraft and engine manufacturers to replace the airbus A320: Why is this so important for Air France? Today, we plan to replace about half of our medium-haul fleet. While the aircraft and engines have been significantly improved since the A320 entered service in 1988, these advances did not concern energy aspects. Our top priorities were reliability, on-time performance and maintenance costs, since fuel was a relatively small part of total operating costs – but this is no longer the case. While “emerging” airlines need airplanes to meet their growth requirements, traditional carriers such as Air France focus more on fleet replacement. For us, this capital investment is only justified if we can cut operating costs by 16 to 18 percent. Demand in the 80 to 240 seat segment will in fact be redistributed, because renewal of our short and medium-haul fleets will not
Air France has 131 A320 family aircraft in its short/medium-haul fleet.
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