SPECIAL REPORT

TOTAL SERVICE

Portrait of a booming business
Sàfran has three pillars of growth – aerospace, defense and security – and the former is in the midst of a boom.

We have set a new record for CFM56 engine orders each year since 2005, including an all-time record of 2,704 in 2007. Business is equally buoyant in the aircraft equipment and helicopter engine sectors, including more than 1,000 turbine engines ordered last year.

The fleet of engines produced by Sàfran companies is growing at a heady pace, with nearly 18,000 CFM56 turbofans and 14,000 helicopter turbines now in service around the world. A CFM56-powered plane takes off somewhere in the world every 3 seconds, and every 2.5 seconds a plane touches down on its Messier-Dowty landing gear.

Aircraft generally stay in service for over 30 years, so you can imagine the tremendous business potential for any company capable of giving its customers the appropriate support services for these planes. Today, vendors no longer just deliver a new system and then spare parts. Customers expect across-the-board support for the entire function, whether propulsion, braking, flight control, etc. Which means we are constantly coming up with innovative new offerings that span a broad spectrum of needs: contracts per hour of flight, fleet management assistance, total maintenance packages and more.

Our complete range of services, coupled with a fast growing installed base, are critical assets for Sàfran, and will provide solid foundations to spur future growth and create value for our shareholders.
Sagem Sécurité (Safran Group) will supply biometric border control gates for Terminal 3 at the Cairo airport.

The company’s automatic fingerprint recognition technology ensures secure, reliable identification, and accelerates the control process for passengers, especially pre-registered and frequent flyers. Biometric ID systems by Sagem Sécurité are installed in more than 60 countries.

Its ID control solutions have already been chosen for similar applications in several major airports, including in Great Britain (iris recognition), Australia (facial recognition) and France (fingerprint recognition).

Results from the initial flight tests of the SaM146 are very encouraging. Tests started at the end of last year in Russia, using an Ilyushin Il-76LL flying testbed. By the end of February 2008, the engine had logged 42 hours in the air and satisfied all performance objectives. At the same time, two engines have been delivered to Sukhoi in preparation for the first flight of the Superjet 100.
**FIRST TESTS OF SILVERCREST CORE A SUCCESS**

At the end of January, Snecma (Safran Group) announced the initial results of a series of tests of the Silvercrest engine core demonstrator. Based on 35 hours of operation, all performance objectives were met. These tests confirmed the performance delivered by the compressor and combustor, plus the efficiency of the high-pressure turbine, as well as checking the dynamic behavior of the entire core. Designed for super-midsize to large business jets, the Silvercrest engine family is rated at 9,500 to 12,000 lb of thrust. Snecma is the first manufacturer in this thrust class to validate a new engine concept and test it on a core demonstrator. Tests started last December at the Snecma plant in Villaroche, near Paris, and will be completed in March 2008.

**FOCUS ON COMPOSITES**

Snecma Propulsion Solide (Safran Group) is strengthening its position in the aviation composites market. Having already developed the carbon composite material that Messier-Bugatti used to become the world’s leading supplier of aircraft carbon brakes, Snecma Propulsion Solide is now teaming up with Snecma and Aircelle to develop composite nozzles for commercial airplane engines. Snecma Propulsion Solide created a new Aeronautics and Composites division on January 1st to further develop this business and provide a single point of contact for partners and customers alike.

**TURBOMECA EXPANDS PRESENCE IN U.S.**

Turbomeca (Safran Group) has completed the construction of its new plant in Monroe, North Carolina. Spanning some 100,000 sq ft, this plant will start producing helicopter engine parts in June, and should have 180 employees by 2010. The new plant will help Turbomeca keep pace with the growth of its business in the American market, especially as supplier of engines for the U.S. Army’s UH-72A helicopters, while also increasing production capacity in the dollar zone (see page 26).

**Messier-Bugatti kicks off wheel and carbon brake production in the U.S.**

In January 2008, the Messier-Bugatti USA plant in Walton, Kentucky started production of wheels and carbon brakes, and shipped its first products. A plant extension was built in less than a year to handle this new activity. The aim is to increase production to keep pace with Messier-Bugatti’s growing business in North America. In addition to supplying wheels and carbon brakes for the Boeing 767, 777LR, 787 and 737NG commercial airplanes, Messier-Bugatti also supplies these products for the U.S. Air Force’s KC-135 tankers and C-17 cargo aircraft.

**Landing gear gift for Emirates**

Emirates’ technical training center has received an Airbus A340 landing gear leg as a gift from Messier Services (Safran Group), to help train student mechanics, an act that reflects Safran’s long-standing presence in the Middle East.

**In January 2008, the Messier-Bugatti USA plant in Walton, Kentucky started production of wheels and carbon brakes, and shipped its first products.**

**Through this fan module, including compressor, fan, intermediate casing and bearing housings, we wanted to advance the ‘state of the booster art’.”**

**Techspace Aero (Safran Group) is coordinating all work on the low-pressure compressor, or booster, being developed through the European research program VITAL. Financed by the European Commission, VITAL is a four-year program that aims to significantly reduce the noise and CO₂ emissions generated by aircraft engines. Fellow Group company Snecma is leading a consortium of 53 partners in this program, including Europe’s leading engine manufacturers and research organizations. The booster developed by Techspace Aero will be tested during the first half of 2008 at the Central Institute of Aviation Motors (CIAM) in Moscow, to validate the technologies used. The idea is to develop a lighter, more compact unit, coupled with better aerodynamic performance.**

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**“Through this fan module, including compressor, fan, intermediate casing and bearing housings, we wanted to advance the ‘state of the booster art’.”**

**PIERRE GUILLAUME**

**VP ENGINEERING**

**TECHSPACE AERO**

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When engineers set sail

**GUILLAUME VERDIER, ONE OF THE TWO NAVAL ARCHITECTS WHO DESIGNED THE OCEAN RACER SAFRAN, RECALLS THE SPECIAL BONDS ESTABLISHED WITH THE GROUP’S ENGINEERING TEAMS AND THE SHARING OF EXPERIENCE THAT LIE BEHIND THE BOAT’S CONCEPTION.**

What did Safran contribute to the boat’s design? Safran contributed extensive advice, expertise and technologies, but above all it provided a rigorous approach to the work process. The traditional design sequence with its three stages – sketch, first draft and finished design – was refined with a system of meetings to review each step and record the reasons for each decision.

What are the advantages of this work method? The fact that decisions can be traced prevents accidental interference with decisions taken earlier, and also helps avoid time-wasting by rehashing choices already made. When a doubt or problem arises, a glance at the database is enough to explain why a particular decision was made. What is it that makes Safran special as a sponsor? Safran embodies an engineering culture, something that is quite rare among sponsors. Nevertheless, they haven’t interfered at all. The teams got along very well, so we had time to do things properly. I think that helps explain the quality of the results.

Enthusiasm for the project has seized the Group’s employees, thousands of whom crowed into the traveling exhibition of photos shown at 14 Safran plants… not to mention the hundreds of others who followed the Transat Jacques Vabre hour after hour on the website set up by Safran for the occasion (www.safran-sixty.com).

G. SEQUEIRA-MARTINS

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**SPONSORSHIP** To enhance its public image and develop its corporate culture, Safran is sponsoring ocean racing in an original way: by commissioning its own ocean racing yacht, incorporating several of the Group’s distinctive technologies.

**SAFRAN AROUND THE WORLD**

When it was formed in 2005, the new Safran Group wanted to establish a solid global reputation and develop a dynamic corporate culture, based on a passion for performance, team spirit and total quality. Sports sponsorship was identified at the time as one way to achieve this end.

Since technological expertise is the Safran Group’s trademark, it sought a sport that could use advanced technologies – and sailing immediately became an obvious choice. It is also a discipline that encourages going beyond one’s normal limits. In the words of corporate vice president for communications Françoise Descheemaeker, “It’s a sport whose values of commitment, courage, team spirit and innovation are in keeping with our own.”

To get the sponsorship project going as early as possible, Safran raised its pennant in 2006 on a leased boat, the former Kingfisher which Ellen MacArthur had sailed into second place in the last Vendée Globe round-the-world solo race. This preliminary phase enabled Marc Guillemot, an experienced multihull skipper, to refamiliarize himself with monohull sailing. In the meantime Safran set up its project team, helped draw up the boat’s specifications and confirmed the technical choices to be entered in the future”. This team was identified at the time as one way to translate Safran’s expertise and technologies, but above all it provided a rigorous approach to the work process. The traditional design sequence with its three stages – sketch, first draft and finished design – was refined with a system of meetings to review each step and record the reasons for each decision.

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G. SEQUEIRA-MARTINS
**spec**

The traditional hydraulic and pneumatic circuits used on aircraft are gradually being replaced by lighter, more efficient electrical systems. The Safran Power Electronics Center (spec) is leading the drive towards tomorrow’s “electric” aircraft.

**towards more electric airplanes**

aircraft weight and thus fuel consumption. starting with the eternal goal of reducing trend towards “more electric” aircraft, there are three main reasons behind the next generation of single-aisle twinjets.

Fostering disruptive technologies

The Safran Power Electronics Center was launched in 2004 to develop the technology building blocks, which will be gradually integrated in robust new solutions. Hispano-Suiza is the Group leader for this program. “Spec” was initiated with the electrically actuated thrust reverser for the A380, the first time we faced the challenges of power electronics on this type of equipment,” explains Serge Bérenger, Vice President, Strategy and R&T at Hispano-Suiza. “Spec was created as an incubator to foster the emergence of disruptive technologies and share this knowledge with the 11 Group companies concerned by more electric aircraft. It draws on a vast network of university labs to leverage our own research efforts. In fact, the success of Spec depends on striking a balance between the worlds of industry and research, as well as on the leadership qualities of its managing director, Régis Moury.”

Spec has a two-pronged mission: developing the technologies required, and managing the risks associated with these technologies. Both of these aspects are based on TRL, or Technology Readiness Levels, a process which expresses different levels of technical maturity for emerging technologies in relation to the stipulated deadlines and imperatives of risk management.

“Spec is the ‘upstream’ technology facet of the spec research initiative. It involves at the end of 2007 came up with new progress review, as the first product us to investigate the array of possibilities before making choices and starting the more concrete and costly maturation phase.”

compact, reliable and thermally efficient

Spec’s goals for 2010-12 are to make these systems more compact (four-fold decrease in weight and volume) increase the reliability of electrical systems and enhance the thermal efficiency of aircraft and engine systems. A symposium organized at the end of 2007 came up with a progress roadmap. “For the moment we have achieved equivalent weights for conventional and new technologies, but our electrical architectures already offer better reliability,” notes Bérenger. The main question is project feasibility, which is the goal of the Ampères demonstration program. In two years, we’ll be ready for a new progress review, as the first product demonstrators are rolled out.”

**Focus on Ampères**

“Integrating electrical systems on aircraft means we have to optimize the overall architecture to take advantage of the specific advantages of electrical power,” explains Didier-François Godart, Ampères project manager at the Safran R&T division. These projects involve the collaboration of several Group companies. Four projects are now under development: Power Plant System (Sncema, Hispano-Suiza, Aircelia); Landing System (Messier-Dowty, Messier-Bugatti, Hispano-Suiza, Sagem Défense SÉCURI); All-electric Wing Flight Actuation (Sagem Défense Sécurité, Hispano-Suiza); Electrical Wiring Interconnection System (Labinal) Ampères and Spec are complementary: Spec develops the technologies, and Ampères the architectures. “The aim is to demonstrate the technical maturity and robustness of our solutions by 2010-11, the expected kickoff date for the development of new medium-haul jetliners,” adds Godart. “Because of the major challenges involved in these programs, with the potential number of sales and quick ramp-up in production, we have to start working with the airframers today, so they can integrate Safran’s work in their design studies. This type of approach is fully in line with aircraft manufacturers’ current objective of encouraging major equipment suppliers such as Safran to take greater responsibility in the supply of integrated work packages.”

March 2008, SAFRAN magazine
Support services are booming in the civil aviation sector, and are now a pivotal part of the market.
BACKGROUND. Air travel is booming these days, and more money than ever is at stake in aircraft maintenance services. But competition is also fierce, and new players are investing in this growth market.

THE FAST-CHANGING SERVICE MARKET

The figures speak for themselves: there were nearly 18,800 commercial airplanes in service around the world in 2007, and this should increase to 27,000 or more by 2016. The service life of a commercial airplane spans decades, while the auto industry, for instance, calculates in terms of years, and replaces its models ten times as fast. “That makes for tremendous differences in terms of technical support and other services,” says David Steward from the consulting firm Aerostategy. “Longer service life means more maintenance is needed, and the long-distance nature of aircraft implies huge requirements in terms of logistics and the geographical distribution of infrastructure.”

The industry term is MRO – maintenance, repair and overhaul. MRO needs grow in tandem with fleet size, and are undergoing major transformations, starting with increased outsourcing. Airlines now call on outside companies for some 52% of their MRO services, and this will increase to 62% by 2016 according to Aerostategy. “This trend primarily reflects companies refocusing on their core business,” notes Stewart. “Airlines, and especially the low-cost carriers that are driving today’s growth, know that their maintenance costs are higher than what specialized MRO firms can offer. Another factor behind this trend is an extremely broad offer of services, along with the high level of investment needed to set up a modern maintenance shop.”

OEMs and airlines

Engines account for the largest part of the aircraft MRO market, at about 35% of total business volume. In fact, maintenance services are generating a larger and larger share of engine manufacturers’ overall revenues. “Services are a very important part of the financial equation for engine-makers, and it also keeps them in direct contact with the end user,” explains Stewart. “Services are critical for all OEMs [original equipment manufacturers], since it allows them to stand out from the competition.”

OEMs are therefore major players in the MRO market – but far from the only ones! Over the last few years specialists such as Lufthansa Technik, Air France Industries and ST Aerospace [affiliated with airlines or independent] have developed their capabilities in a drive to become world-class players. A third type of provider has also entered the market, namely non-traditional investors who are attracted by the business opportunities in a very healthy market. One of the best examples is Dubai Aerospace in the United Arab Emirates, which is helping turn the Middle East into a strong growth zone for aviation services. However, the Middle East is still a minor player with only 4% of the global market, well behind North America (39%), Europe (28%) and of course Asia (22%) – a region that everybody is watching very closely these days.

VIEWPOINT

Besides outsourcing, what are the other current trends in the air transport industry?

Spares management is also experiencing a transformation. Today, airlines want their suppliers to manage spare parts. They no longer want to be responsible for warehouses loaded with very costly parts. Suppliers have understood this trend, and have adapted to these new requirements.

Are counterfeit parts a real problem for the air transport industry?

It’s still a relatively minor problem. OEMs are in fact more worried about parts designated PMA, for “Parts Manufacturing Approval”, which are certified parts made by other manufacturers. If OEMs want to compete for airline business, they will have to counter-attack by offering less expensive parts, and above all by providing new services to differentiate themselves from simple manufacturers.

Air traffic in Asia is booming these days – is MRO capacity growing at the same rate?

This is a major stumbling block for the near future. Traffic growth in the Middle East, China and especially India will soon demand additional infrastructure if we don’t want this growth to be nipped in the bud. Things are more stable in North America and Europe, where current facilities match the needs of a mature market.

According to the analysts at Aerostategy, the MRO market will jump from $46 billion in 2006 to over $56 billion in 2016

F. LERT

F. LERT

FRANK JACKMAN

EDITOR-IN-CHIEF OF AVIATION WEEK

OVERHAUL AND MAINTENANCE

© Dr. Brandt
SAFRAN. Safran Group companies are leveraging synergies to offer services that give them a competitive advantage in this fast-growing market.

**SERVICE SYNERGIES IN SYNCH AT SAFRAN**

For a manufacturer, it’s now unthinkable to design an engine without incorporating technical support aspects. And customers no longer buy hardware without also signing a contract for the associated services.

In the aviation industry, this seemingly simple principle runs into rather complex realities. Manufacturers have to manage complete systems, as well as the interface with subsystems that are often made by second or third-tier suppliers. “Offering services is a way of moving up the value chain, while also providing customer support throughout product life, and enjoying the revenues generated through this activity,” explains Thierry Lasbleis, head of customer support at Messier-Bugatti, a Safran Group company.

OEM + services, a winning combination

With markets changing so quickly than ever, customers also increasingly need business models that allow them to plan ahead. In the aviation services market, a “service by the hour” solution is increasingly being used, meaning a fixed rate per flight-hour, so that airlines can better anticipate costs.

“Complete service packages with modular options are a very effective solution used by engine-makers,” says Philippe Carté, head of the customer support division at Aircelle, also a Safran Group company. “Nacelle manufacturers like us are beginning to use this model as well.” The capabilities of Group companies are also magnified by their ability to couple the service business with their innate expertise as the original equipment manufacturer, or OEM. “We can of course guarantee the price of OEM parts, which is a key advantage for our customers,” adds Thierry Lasbleis.

This OEM expertise also underpins the offering of innovative solutions and reliable technical services, which can differentiate a service supplier. To stand out in today’s fiercely competitive market, this is a vital factor. According to François Pichon, director of the Aircelle Europe Services repair center, “As a designer-manufacturer as well as service provider, we are in the best position for certain cutting-edge repairs, and of course we advertise this expertise. Plus, our repairs are better and quicker!”

Messier Services and Messier-Bugatti can make the same OEM claim, and major airlines are very receptive to this argument.

**Pooled costs**

The other type of synergy highlighted by Safran’s aviation companies is their ability to pool costs, especially for facilities located at airports. “We have to multiply our local contacts to really understand the fast-paced changes shaping the air transport industry,” emphasizes Alan Doherty, vice president for sales and business development at Messier Services (Safran Group). We need to be close to our customers, and Messier Services takes a multifaceted approach, spanning the development of local service solutions, such as local wheel and brake repair shops, the use of the Group’s local reps to negotiate contracts with our customers, and pooling the work carried out by technicians.” Furthermore, service partnership agreements have already been set up between Aircelle and Snecma Services, and the latter is holding discussions with Messier Services as well. Other agreements within the Safran Group will undoubtedly follow.

**PROPULSION.** The sale of a new airplane engine goes hand in hand with a service package — a situation that favors Group companies Snecma, Snecma Services and Turbomeca, and helps them boost their market share.

**ENGINES AND SERVICE, TOGETHER FOR LIFE!**

Right from the initial design of an engine, you have to think about how customers will use it. And once the engine is sold, you have to support your customers’ operations. Customer support covers a number of aspects, including maintenance, repair and overhaul (MRO) of course, but also spare parts, training and documentation.

The trend is towards higher-value-added complete support packages and flat-rate support per flight hour. Because services are such an integral part of the engine life cycle, they are inextricably linked with the engine-maker’s business — and this applies to helicopter manufacturers as much as to commercial turbosfans.

“Services account for some 60 percent of ‘turbomachinery’ sales, and the company’s service business is growing 15 percent a year, equally split between the civil and military sectors,” says Édouard Demouy, head of operator support at Turbomeca (Safran Group). These heady figures owe nothing to chance: Turbomeca now holds 87 percent of the MRO market for its engines, and performs the same number of “shop visits” (engine removal for major overhauls) as for the CF6.

The decision to pair engine production and services seems to be the right one, as reflected in the current restructuring of this market. Back in the early 1990s, Allison, a U.S. manufacturer of turbine engines, mainly for helicopters, decided to outsource its services. Subsequently, it had to file for Chapter 11 bankruptcy protection, then in 1995 was acquired by Rolls-Royce, which decreased the number of licensed repair centers and re-acquired MRO facilities.

**SAFRAN SERVICES WORLDWIDE**

Safran’s MRO facilities are located in Australia, Belgium, China, France, Mexico, Morocco, Singapore, the United Kingdom and the United States.

**March 2008 . SAFRAN magazine**
CFM56 MRO: a highly competitive market

The service business for commercial jet engines is booming. There are over 17,000 CFM56 engines in operation, generating an annual MRO business volume. The two leaders in this market are the service arms of the manufactur- ers, namely GE Services and Sneca Services. “Although our two companies maintain their leadership, there are a number of competitors in this market, and our customers are free to choose their service provider,” notes Michel Brioude, head of the commercial engines division at Sneca Services. “Our competitors may be independent repair shops, or airlines with their own service centers.” However, Sneca Services boasts a major advantage in this competition, namely its close links with the OEM, Sncmca. “Because of this close competition,” adds Brioude, “we have to give airlines a real service edge by drawing on our comprehensive understanding of the engine and its operating environment.”

Dale Wilkinson, Vice-President, Materials Management, Northwest Airlines

What are the advantages for a big airline like Northwest to outsource maintenance and work with a company like Sneca Services? There are many advantages to outsourcing maintenance for a large airline like Northwest but I’ll focus on just one. Cost reduction. Let’s use the CFM56-5A as an example. If we had elected to perform maintenance for these engines back in 1999, we would have had to invest millions of dollars in facilities, tooling, equipment, labor, training and most of all, inventory. Instead, we outsourced these engines and have been able to utilize all of the items listed above on a shared basis with other operators, paying only for what we need. There are also many advantages from working with a company like Sneca Services, far too many to discuss here. I’ll choose one, cost reduction. Sneca is able to offer us very competitive costs over the projected 23 year term of our agreements. As the OEM, they are cost advantaged for materials vs. independent shops who, for the most part, still have to purchase the majority of high cost materials from the OEM. We have not seen a business case so far where independent shops can overcome this material cost disadvantage with repairs and PMAs. While there is lots of talk about future PMAs for life limited parts and the like, we enjoy the material cost benefits today while others wait for development, test and approval of future PMAs. Only time will tell who has taken the most cost-effective path but we are very confident that Northwest made the right decision.

What were the reasons to work with Sneca Services vs. other MRO suppliers? Northwest chose Sneca Services over other MRO providers based upon many factors including, but not limited to, quality, consistent performance, regulatory compliance, resources, technical expertise and infrastructure. We have stayed with Sneca Services for all of these reasons and because of the deep relationships we have developed over the past eleven years. Northwest has gone through several ups and downs, including bankruptcy and reorganization and Sneca Services never wavered once in their commitment to us or in their outstanding support. We have no finer supplier than Sneca Services.

Monitoring engines in real time

The commercial engine market is characterized by its overall size and the number of large operators. This is very different from the helicopter market, composed of a large number of smaller customers. “Although we have a few customers with fleets exceeding 500 machines, more than 85 percent of our customers operate fewer than five helicopters, and 60 percent have just one,” says Didier Desnoyer. “It’s expensive trying to manage this type of scattered market, and it also makes it more difficult to manage feedback, which is critical in the service business.” To overcome this handicap, Turbomeca is investing in a new initiative called SMART (System for Mobile Maintenance Accessible in Real Time). This project provides for certain key components to be fitted with a chip and a satellite link, so that vital engine data is automatically sent to the operator, and then to Turbomeca.

For CFM56 specialist Sneca Services, the top priority is to help operators reduce their maintenance costs, and thus their total cost of ownership. “We aim to increase engine life ‘on wing’, which decreases the cost per flight-hour over the medium and long term,” explains Michel Brioude. The key to this objective is remote monitoring of engine health. “By keeping permanent track of engines in service, our technical teams analyze the operating data and can reduce the number of emergency servicing operations and engine removals,” Sneca Services is very heavily involved in this program, since it remotely monitors a large number of engines. And as Brioude points out, “It’s also a way for us to add value to services, and to carve out a distinctive position in the increasingly competitive CFM56 maintenance market.”

Service by the hour

The fast-paced growth of discount airlines has considerably changed the maintenance market and diversified requirements. Some carriers still ask for simple repairs on demand. But others want a more complete package, from better cost control to complete fleet management support. One theme pops up frequently: contracts per flight hour. “In 2007, about half of our business was generated by contracts per flight hour or exclusive con- tracts,” notes Brioude. “This ratio should remain about the same, because the idea of the long-term contract is advantageous for both parties. An agreement of this type, based on offering customers a com- plete slate of assistance services, ensures maximum reliability, reduced costs and better planning for shop visits.”

Contracts will probably continue to evolve in the future. For instance, on request from its customers, CFM Interna- tional is already working on the develop- ment of comprehensive contracts includ- ing not only the sale of the engine, but also a service package with MRO and the supply and repair of spare parts. Turbomeca has built up extensive expe- rience with modular and by the hour (BTH) contracts. “We are continually analyzing the market and adapting our range of services,” notes Didier Desnoyer. “Today we sell an engine along with the associated support services. Tomorrow, why not sell a given number of kilowatts of installed power? Wouldn’t that be the ultimate form of service delivery?”

VIEWPOINT

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A GROWING SLATE OF SERVICES

"Our customers today have two main expectations," explains Thierry Lasbleis, head of customer support at Messier-Bugatti. "First, that we guarantee the operational availability of our equipment throughout the life of their aircraft. Secondly, that we provide a business model that allows our customers today have two

1. AVIONICS
2. NACELLES
3. LANDING GEAR

1. AVIONICS
Avionics maintenance sometimes involves very meticulous work, as shown here at Sagem Avionics in Texas.

2. NACELLES
Aircraft nacelles are ofer on-site servicing whenever necessary.

3. LANDING GEAR
A specialty at Singapore-based Messier-Bugatti Services Asia is Boeing 787 landing gear maintenance.

VIEWPOINT

IAN LACHLAN, EMIRATES AIRLINES’ SENIOR VP AIRCRAFT MAINTENANCE

What are the advantages to outsourcing maintenance?

Outsourcing maintenance to third-party organizations is very important and not taken lightly, with numerous factors taken into consideration before any decision is taken. Enhancing internal capabilities versus outsourcing is a norm for consideration as part of the decision-making process along with conducting cost-benefit analysis reviews. However, even if we enter into outsourcing, a continual review of the activities are regularly taken to ensure we are obtaining what is right for the business.

And what are the reasons to work with Messier Services versus other MRO suppliers?

The relationship to date between Emirates and Messier Services has been good. Messier Services have been reactive, extremely supportive, flexible and professional in assisting Emirates to maintain its operation both in its normal activities and in times of system deficiencies. Recent difficulties experienced with the A330 and A340 undercarriage have highlighted how well suppliers can work at implementing a program that mitigates risk to the operation and why we hold Messier Services in high regard. Whilst this being accomplished efficiently and effectively, it however has caused disruption to our landing gear overhaul program, mainly due to shortage of landing gear parts that are required for overhaul.

All said, it is important to ensure we all appreciate that relationships have to be worked on continually by both parties in order to be maintained at the good level currently experienced. In addition to our normal relationship, it is important to again place on record our thanks that Messier Services have endorsed our vision that training of engineering personnel is vital and supported our initiative by donating a main undercarriage leg for our training facility. Working with Messier Services with its links to the OEM indeed has further advantages. In addition, I would like to commend all three companies (Messier Services, Messier-Bugatti, Messier-Dowty) in the level of aftermarket support they are providing Emirates.

ELECTRONICS MAINTENANCE

Because of its specialized technical experience, Messier-Bugatti was chosen by Cathay Pacific in 2007 to provide maintenance and repair services for the braking & steering control units on the largest fleet of Airbus A330 and A340 jets in the world.

risk for the service providers, but one in which the odds are on their side, given their in-depth knowledge of the product. And it applies in particular to Messier-Bugatti, which supplies carbon brakes on new aircraft, and then bills according to "cost per landing" (i.e., the customer pays according to the number of landings logged by the brake). "Traditionally, these contracts apply to expendable items such as carbon brakes," notes Thierry Lasbleis. "Our aim is to extend their reach to encompass other equipment which is usually serviced on condition, and not on a regular schedule."

Success in this highly competitive field depends on applying several principles which are not as simple as they first appear: continuous innovation and technical services that offer a distinctive difference. [ ]
12 naval Rafale M aircraft deployed. 12 Safran companies contribute to this multirole fighter.

RAFALE M
MISSION DEPLOYMENT
1. PREPARATION
The Charles-de-Gaulle aircraft carrier is cruising off the coast of Pakistan. A Rafale F2 lines up before its catapult launch. To ensure the aircraft’s precise alignment, the deck crew guides the pilot.

2. TAKEOFF
The tow-bar on the nose landing gear, made by Messier-Dowty, is hooked to a shuttle running along the catapult rail. The Rafale is ready to take off. The pilot gives it full throttle and, after the green light from the launch officer, the "holdback" releases the aircraft, which will reach a speed of 250 km/h by the time it travels the 75 meters to the end of the flight deck.

3. DECK LANDING
Five hours and several aerial refueling operations later, the Rafale is ready to land on the aircraft carrier. Its Messier-Dowty landing gear ensures a perfect landing, absorbing a shock equal to 11.75 metric tons at a sink rate of about 6.5 meters/second. The plane is then brought to a halt when its tail hook grabs one of the taut cables stretched across the deck.

4. POST-FLIGHT CHECK
The crews spring into action and carry out a post-flight visual check of the landing gear while the aircraft is "moored" by the flight deck and hangar crew.

5. ENGINE REMOVAL
For quick checks and servicing, Snecma’s M88 engines are designed to be removed and reinstalled in the record time of just 40 minutes.

6. BREAK
Between two incoming flight waves, one of the flight deck crew members takes a break against a leg of Rafale’s main landing gear (fitted with a Messier-Bugatti braking system).

SAFRAN EQUIPMENT PROVEN IN COMBAT
A unit from the French navy’s air arm was deployed to the Indian Ocean for four months from February to June 2007, as part of the "Agapanthe" mission which involved some 3,000 naval personnel. A full month was devoted to the operation "Héraclès Air Indien" in the skies of Afghanistan, to support the coalition’s troops. The operation involved some 30 aircraft, including 12 carrier-borne Rafale F1 and F2 fighters. All systems and equipment supplied by Safran companies, including Snecma’s M88 engines, showed their reliability during 1,071 hours of flight under difficult conditions: heat, humidity, dust, heavy under-wing loads.

See the Safran website at www.safran-group.com (Aircraft Applications), for a complete list of all Rafale systems and equipment supplied by Group companies.
Markets

**GROWTH.** To keep pace with strong demand for its helicopter engines, Turbomeca has revamped its organization and made major capital investments. These moves have already generated significant improvements in terms of the number of engines produced and quality indicators.

**ENHANCING THE PRODUCTION PROCESS**

Turbomeca, a Safran Group company, set a new record in 2007 by producing a total of 1,274 engines. This beat the previous record set some 28 years ago, a heady total of 1,230 engines produced in 1979. Turbomeca’s impressive performance last year was the result of a well orchestrated plan, based on measures designed to meet a real two-pronged challenge: ensure a long-term rise in production rates to meet sustained demand while continuously improving both product and service quality.

Meeting this daunting challenge demanded changes in the production process itself. The first piece in the puzzle was “Turbo+,” an approach designed to resolve any production problem as soon as it arises. Turbomeca also started setting up autonomous production units at the same time, in 2005. This also allowed staff to monitor problems and eliminate them as quickly as possible. “Through the autonomous units, we were able to move our methods and engineering departments closer to the production teams,” recalls Pierre-Yves Morvan, vice president, integration and engineering departments. “Having production capacity on site allows us to expand our business.”

A new plant in the U.S.

For instance, Turbomeca has built a 108,000 sq ft plant in the United States, in Monroe, North Carolina, on a 16 hectare (40 acre) site. Scheduled for completion in mid-2008, it will produce components for the Arriel engines (Mades, compressors, mechanically-welded housings) that power the U.S. Coast Guard’s HH-65 and the U.S. Army’s UH-72A Lakota helicopters. In addition to meeting growing demand, this plant will also help reduce Turbomeca’s exposure to the current unfavorable euro/dollar exchange rate. Similar reasons were behind the creation of a joint venture with Chinese manufacturer Changkong. Started in 2007, this joint venture already has 20 employees and will be in charge of assembling control units. As Pierre-Yves Morvan explains, “This is another case of supporting our business development by staking out a position as a constructive and above all local partner.” Turbomeca already powers one out of every two helicopters in the pivotal Chinese market.

Uniting to meet common goals

To further improve its cost-effectiveness, Turbomeca has totally outsourced the procurement, purchasing and quality control of commodity parts such as nuts and bolts. Considered “Class C” hardware, these components account for some 3,000 parts numbers out of a total of 16,000. This is a global initiative, spanning all of the company’s facilities worldwide.

One of the main instigators of this

**TURBO+, ENHANCING QUALITY**

The approach embodied in the Turbo initiative was borrowed from the auto industry, but is rarely seen in the aircraft industry. Led by Philippe Larrauri, vice president, quality at Turbomeca, this approach is based on the early detection of problems and their immediate resolution. As soon as a defect is observed, the line is stopped and secured. Teams characterize the problem, then design and apply an action plan to eliminate it. Implemented in 2004, this method has delivered impressive results. In just two years, engine returns have plummeted by 80%, while quality claims have dropped 60% and production delays 30%. These figures are even more impressive since production jumped 30% over the same period.

**TIGHTER RELATIONS WITH SUPPLIERS**

While reducing the number of suppliers by 25%, Turbomeca will also focus on closer relations. A dedicated website will be opened during the first half of 2008, providing access to technical specifications, orders and supply plans. Turbomeca will no longer have to check procurement timetables itself, since each supplier can now do this directly online. Negotiating procedures will only be activated if there is a problem. “That will help accelerate information flows,” predicts Pierre-Yves Morvan, vice president, integration and purchasing. “Suppliers will have the right documents immediately, which will help us boost productivity and reliability, while focusing on our financial performance.”
Turbomeca is accelerating improvement by setting up centers of industrial expertise to group everybody involved in a given family of parts. By consolidating all disciplines and resources (engineering, production, purchasing, management control, human resources, etc.) at all Turbomeca sites, these centers will handle the development, production and support of their assigned parts. Turbomeca created the first two centers in 2007, for control systems and assembly/testing. In early 2008 it will set up centers in charge of reduction gearboxes, air ducts, rotating assemblies, combustion, structures and hydromechanical assemblies.

Decision was the creation in 2005 of a procurement center, consolidating the procurement, purchasing and quality control departments. Sharing office space, they quickly learned to work together. According to Pierre-Yves Morvan, this was an irresistible process: “In the beginning they just coordinated their actions in relation to suppliers, then they started to carry out joint visits, and now they set common goals!”

Another key to the effectiveness of the new organization is an increase in staffing, from 45 in 2005 to 90 today. These additional resources and change in methods have borne fruit. The defect rate has dropped from 10,000 ppm (parts per million) in 2005 to 2,500 ppm in 2007. The missing parts rate (parts missing when needed for assembly) has become negligible, dropping from 20% in 2005 to 1.8% today.

But Pierre-Yves Morvan has no intention of resting on his laurels. “Now that we have established the conditions needed to handle production growth and ensure quality, we will reduce our supplier base and strengthen our relations so we can focus on further boosting performance (see box).” In particular, Turbomeca has set up specialized centers of industrial expertise for each type of part (see box). Today’s sustained market demand means that Turbomeca will continue to set new records, and it will also continue to apply the measures needed to stay on track.

G. SEQUEIRA-MARTINS

Turbomeca USA’s plant in Grand Prairie, Texas includes the original building (in the foreground) and an extension built in 2006 (in back), for total floorspace of 10,400 m². Part of the building houses subsidiary Microturbo.
STRATEGY. With a new majority shareholder, Sagem Communications now has the resources needed to become a world leader in broadband communications and convergence technologies.

SAGEM COMMUNICATIONS HEADED FOR NEW HORIZONS

In January 2008, Safran finalized its sale of Sagem Communications to The Gores Group, a California-based investment firm. Sagem Communications, a 1.3 billion euro company with 6,500 employees, is specialized in broadband communications and convergence technologies, including printing terminals, digital TV set-top boxes, broadband and residential terminals, telecom systems and partnerships. This market is expanding, but is also undergoing global consolidation.

According to Sagem Communications chairman and CEO Patrick Sevian, “We swung back to the black in 2007, and hold European leadership positions in our markets. But until now, we didn’t have the critical mass needed to play a top-tier role in the global market. “Our business plan is to become one of the world leaders in broadband terminals and convergence solutions, through both organic growth and acquisitions.”

Seizing opportunities
Even better than Safran, focused on the aerospace, defense and security markets, The Gores Group can provide Sagem Communications with the resources needed to seize opportunities in today’s market and build a hub offering broader international coverage. “The telecom business does not really offer the optimum path for technological and commercial synergies with Safran’s other businesses,” notes Xavier Lagarde, executive vice president of Safran and head of the Communications branch. Sagem Communications will therefore be shaping its development with The Gores Group, but Safran nonetheless retains a 10% stake, as well as being represented on the company’s supervisory board. Furthermore, Sagem Communications’ employees and management are heavily involved in this project, since they hold some 20% of the new company’s share capital.

B. DIETZ

VIEWPOINT

STEVEN YAGER, SENIOR MANAGING DIRECTOR OF Mergers-Acquisitions, THE GORES GROUP

The acquisition of Sagem Communications is especially important for The Gores Group, since it’s our first transaction of this size in France. The company is operating in a growth market, spanning gateways, set-top boxes and printing terminals. Our goal is for Sagem Communications to keep pace with this trend by developing its business through both organic growth and acquisitions. The sector is still highly fragmented, but it is in the process of consolidation, and we plan to make Sagem Communications the hub of a world-class player based in France. We are therefore planning further acquisitions, and our position as an integral part of the American economy, along with our financial support, will facilitate this growth. We are applying this development strategy in full agreement with company management, and we will be providing unstinting support.
NACELLES: THE FUTURE LOOKS COMPOSITE

The A380, for example, has been dubbed "the silent giant," notably due to the acoustic qualities of the nacelle, which makes the new Airbus super-jumbo almost as quiet as a single-aisle aircraft one-third its size.

Innovations in the intrinsic properties of nacelles through the use of composite materials, and the associated fuel savings, make the new technology extremely attractive to airlines and planemakers.

"We have the ability to develop a nacelle one-third its size," explains Pascal Marchant, Research & Technology program manager at Aircelle (Safran Group). "Today, the nacelles on the Airbus A380 contain about 60% composite materials." There are several reasons behind this development.

First, composite materials are about half as dense as aluminum, enabling significant weight savings for propulsion systems and the aircraft as a whole. "Reducing aircraft weight means lower fuel consumption," stresses Marchant. Secondly, composite components can be made as single-piece parts, and integrated in a single step, unlike yesterday's multi-part assemblies. This goes hand-in-hand with another benefit: there are no restrictions on component geometry. "We have a range of processes that allow us to deliver literally any feasible geometry," adds Marchant. Complex configurations like double curves are now possible. A "We are confident that the MFN for example, contains 70% composites. But it was also thanks to our willingness to enter into a risk sharing partnership under a proportional risk and revenue sharing partnership agreement in the civil aviation sector, and we are right on schedule," says Jean-Michel Georges, civil aviation programs manager at SPS.

"Aircelle chose SPS because of our expertise in composite materials. The MFN for example, contains 70% composites. But it was also thanks to our willingness to enter into a risk sharing partnership under a proportional risk and revenue sharing partnership agreement in the civil aviation sector, and we are right on schedule," says Jean-Michel Georges, civil aviation programs manager at SPS.

Still a lot to learn...

As part of its drive to deliver low cost of ownership solutions, Aircelle – a leading supplier of composite components to the aircraft industry – is investing heavily in research and development to optimize the composite material production process and thus offset the additional costs that are still associated with their use.

Generally made of a fiber-based reinforcement (glass or carbon fiber) and a binder (epoxy type resin, for instance), composite materials have not yet yielded all of their secrets. Aircelle's ongoing efforts to grow its expertise through applied technologies and skills developed for solid rocket motors to the aviation industry, SPS is looking to move into a new growth sector to compensate for a flat space propulsion market.

"Aircelle has recognized the potential to be the material of choice for aircraft engine nacelles. Aircelle has therefore opened a new composites laboratory to consolidate its cutting-edge position in this richly promising market.

Composite materials are only half as dense as aluminum.
Sperwer, the operational tactical UAV

Canadian troops operating in Kandahar, Afghanistan no longer deploy without their trusted Sperwer (Dutch for “sparrow hawk”), a UAV that surveys the surroundings to detect any suspect movements. This little unmanned aircraft, designed by Sagem Défense Sécurité, a Safran Group company, is invaluable to troops operating in the field. The Sperwer UAV, also called a drone, can survey large zones day or night, thanks to its electronic “eye”, designed to locate and track a point on the ground no matter how the aircraft itself moves. In Afghanistan, soldiers consider it their “guardian angel”.

Sperwer is a tactical UAV, capable of flying missions up to 180 kilometers from its base and offering six hours endurance. Capabilities like these have spurred its success in export markets, as Jean-François Coutris, director of the Sagem Optronics and Defense division, notes with pride: “We’re the only company to have sold a UAV system to five different countries, namely the Netherlands, Sweden, France, Greece and Canada. Even the United States and Israel, who are very active in this market, haven’t done any better abroad!” Sagem Défense Sécurité has produced over 100 drones to date for its customers.

Top-flight imaging systems
UAVs are very complex systems, demanding expertise in a variety of advanced technologies: navigation, communications, software, optronics, cryptography, systems integration and mission planning. According to Sperwer’s users, its strong point is the quality of its imaging system, which provides a rich harvest of information. The imaging system is more than just a sensor such as a camera, radar, etc. All data has to be transmitted back to the ground, in total security, and processed in workstations. Once the threat has been identified, decisions are made and defensive systems triggered (artillery, land forces, air-to-ground weapons, etc.);

The Sperwer system is based on a combination of optics and electronics – the “eyes” referred to above. Sperwer offers all the advantages of a real tactical system. It’s launched by a catapult and doesn’t need a runway; it lands by deploying a parachute and airbags – which means it can be used anywhere, as close to the action as needed, and can be recovered very easily, without danger, even if an incident should occur. The catapult launch also turns out to be an advantage for armed forces training, as division head Coutris explains, “Because of flight safety regulations in European airspace, any UAVs not fitted with a parachute have to be operated over non-inhabited zones – a restriction that doesn’t apply to our Sperwer!” For instance, one European manufacturer had to carry out flight tests in Lapland!

Beyond intelligence
UAVs were originally designed primarily for intelligence gathering, especially in support of intense military engagements. But their scope of use has expanded over the last fifteen years. “They are increasingly used as trailblazers to help ground troops,” notes Coutris. “In France, Sperwer UAVs were even used for security surveillance during the Franco-African summit meeting in early 2002, or during the ceremony commemorating the Battle of the Somme later that year. Today, they are also used by French forces in Kosovo.”

While the Sperwer is one of the few UAVs operating today that is combat-proven, it continues to be upgraded to address evolving user expectations. There are two main trends in fact. First, armies want very small drones so they can employ them everywhere, even at the cost of losing some data quality. Secondly, air forces are seeking very small drones to expand their scope of action.

Sagem Défense Sécurité is working to meet these two requirements. “We’re focusing on making the Sperwer even more compact and tactical, in other words, easier to transport and easier to operate,” says Coutris. A new version will also offer greater range.

UAVs are a perfect fit with the new types of missions assigned to today’s armies: defend against asymmetrical threats, support peacekeeping and reconstruction missions. Many countries want to deploy their own drones, since they attract favorable media attention and are considered a clear symbol of national sovereignty and a modern military presence. One thing is sure, however: drones, as an excellent means of mastering battlefield information, will continue their ineluctable rise!

B. BAUDIER

These photos show the terrain, habitations and vehicles as seen from the Sperwer UAV. It is catapult-launched (photo 1), so it doesn’t need a runway for takeoff. Sperwer can see both day and night (photo 7), and lands using a parachute and airbags.
LANDING GEAR. Messier-Dowty teamed up with Airbus early in the A350 XWB program, enabling it to develop a highly innovative landing gear for this new-generation widebody twinjet.

GEARING UP FOR THE A350 XWB

The Airbus A350 XWB was one of the stars at the 10th Dubai airshow in November 2007, logging 80 firm orders during the show to bring the total to over 300. Messier-Dowty, a Safran Group company, is in charge of main landing gear design, development, testing, production and support. The A350’s main gear features state-of-the-art technology to satisfy a very demanding set of specifications, as Chris Morgan, the program director at Messier-Dowty, explains: “The main innovation on this landing gear is the extensive use of titanium, a material that combines light weight with high strength and corrosion resistance.” These qualities translate into lower operating costs for the airline.

A long-standing partnership with Airbus. The collaboration between Messier-Dowty and the European planemaker reaches back a long way. “We have worked on all Airbus airplanes,” notes Morgan with pride. But the A350 marks the first time that Messier-Dowty joined the program so early in the process. Teams from the two companies started working together on the aircraft’s design in 2005, in particular to optimize the layout of the landing gear bay in the fuselage. “This is a much more efficient way of working,” explains John Roberts, vice president of program engineering at Messier-Dowty’s Airbus and European Programs business unit. “All of the teams work on the same production platform. We can discuss things, explain where we need more room for example, and work together to come up with solutions. The upshot is that we can reduce our costs and develop the lightest possible landing gear. At the same time, we used the extensive feedback from our customer support network to make sure this product matched the airlines’ real needs.”

The main landing gear is of course perfectly integrated in the aircraft, whether the four-wheel version for the A350-800 and -900 models, or the six-wheel version for the A350-1000 (takeoff weight of 305 metric tons/670,000 lb). “Early integration also allows us to carry out more tests to guarantee reliability,” adds Chris Morgan. This helps Messier-Dowty meet the objectives set by Airbus for the new A350 XWB, namely design an aircraft that is as economical, light and reliable as possible.

Lighter, quieter. The new design of the A350 landing gear incorporates concrete solutions to protect the environment. For example, the traditional use of chrome or cadmium coatings is eliminated, and replaced by other processes and materials, such as the naturally corrosion-resistant titanium. John Roberts emphasizes that “The landing gear’s design offers improved performance during approach, in particular lower noise during approach. This is also a logical next step as the jet engines themselves become quieter than ever.”

As the designer of the main landing gear on the A350 XWB, Messier-Dowty has stepped up its relationship with Airbus. Not only does the new-generation landing gear feature technical solutions that can be reused on new aircraft, it also helped develop more efficient joint working methods with Airbus.

With the delivery of the first landing gear slated for April 2011, the technical and methodological innovations developed for the A350 are very promising. The potential market for this type of aircraft is projected at 7,000 through 2030. And production of the A350 XWB will stretch over at least the next 25 years, making this a very important program indeed for Messier-Dowty.

A. PAPEGUAY
SECURITY. A portable security solution that provides a perfect fit with current trends in e-commerce could alleviate the concerns of the many consumers who are reluctant to do their shopping and banking online.

YpsID e: E-COMMERCE SECURITY IN YOUR POCKET

Question: what’s small, smart and attractive to bankers? Answer: YpsID e, a fraud-proof portable identity authentication solution delivered in a USB flash drive, developed by Sagem Sécurité (Safran Group) for use in online financial transactions. Unveiled in Paris last November at the international trade show Cartes & Identification 2007, YpsID e will be on the market this spring. "With this pint-sized flash drive, entering a customer number and a PIN number to access an online banking site is a thing of the past. Users can simply plug the device into a computer USB port, enter a four-digit security code, and YpsID e does the rest," explains Nicolas Goniak, program manager at Sagem Sécurité. First, YpsID e checks that the bank’s website has not been hijacked by a “fake page”. It then generates a unique, one-time password for the transaction to eliminate the risk of interception by hackers. Beneath its sleek exterior, YpsID e offers state-of-the-art authentication capabilities, based on Sagem Sécurité’s expertise in cryptography and the smart card know-how of Sagem Orga.

Security: a shot in the arm for e-commerce

These technologies are the driving force behind the latest development strategies for e-banking as well as e-commerce in general. “In the last few years, banks have begun overhauling their business model to focus on high-added-value activities like loans, life assurance and financial products, while encouraging the use of online banking for day-to-day transactions such as payments. The only problem is that many customers are still reluctant to do their banking on the Internet due to concerns about fraud, or a general lack of confidence,” adds Nicolas Goniak. Given that establishing and maintaining consumer confidence is vital to the continued growth of e-commerce and e-banking, a solution had to be developed to reassure consumers and unleash the power of the Internet.

This is where YpsID e comes in. Thanks to its flawless authentication capabilities, customers can relax in the knowledge that they are logging on to a genuine online banking website. The flash drive can be attached to a keychain or slipped into a wallet. Even better, it can be used on any computer and does not require special software, guaranteeing security whether used at home, at the office, or in a cybercafé. This simplicity makes YpsID e ideal for marketing to the banking sector and the general public alike.

Banks like it simple

The product’s unrivaled combination of simplicity and powerful security capabilities give it the edge over much less practical solutions offered by competitors, notably dynamic code generators – pocket calculator-sized devices designed to produce a code which then has to be input into a computer. YpsID e is infinitely more practical. Banks were quick to welcome YpsID e on its launch at the Cartes 2007 trade show, particularly since the product offers end-to-end security, giving customers confidence in online banking websites, and allowing banks to recognize users when they go online. Unlike competing solutions, YpsID e can be mass-produced fast enough to meet the needs of the retail banking sector with its millions of customers, enabling Sagem Sécurité to target this key market.

While banks are the most immediate market, YpsID e could also provide an attractive solution for major online businesses aiming to boost confidence among customers. In particular, it can keep pace with emerging web trends like aggregators, which bring together all of an individual customer’s bank accounts within a single portal, and virtual malls. YpsID e can deliver secure access to all of these new services.

D. BAUDIER

How much banking fraud is there on the Internet?

It’s difficult to find accurate figures, given the unwillingness to address online fraud in many countries, born of a fear of spreading alarm among consumers. In addition, many victims are reluctant to come forward. A study in the United States, however, valued online fraud at $3.5 billion annually – equivalent to $38 per Internet user per year. The same study found that 3.5 million Americans have at some time fallen victim to “fake page” scams.

How can YpsID e help fight online fraud?

It provides strong authentication between user and server – something that can admittedly be achieved by other solutions. The key feature of YpsID e is its portability, which enables it to meet the needs of both banks and users. And it’s competitively priced too. Young people are increasingly being targeted by banks seeking to boost their customer base. In this segment, home banking is no longer enough: young people want to access mobile banking via cybercafés or PDAs, bringing a whole new set of security challenges. YpsID e was designed with precisely these needs in mind, making it the next-generation solution that provides a perfect fit with current trends in e-commerce.

D. BAUDIER

March 2008 _ SAFRAN magazine

viewpoint

PHILIPPE LE PAFE, KEY ACCOUNTS SALES & MARKETING MANAGER AT SAGEM SÉCURITÉ'S BIOMETRIC TERMINALS & SSI SALES & MARKETING DEPARTMENT

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D. BAUDIER
NAVIGATION. With the development of an inertial navigation system for the Airbus A400M military transport aircraft that also meets civil aviation requirements, Sagem Défense Sécurité has reached a turning point in its drive to join the small circle of companies active in this sector.

INERTIAL NAVIGATION: MEETING MILITARY AND CIVIL STANDARDS

Sagem Défense Sécurité (a Safran Group company) is embarking on a new stage of its history with GADIRS. The GPS Air Data and Inertial Reference System, an ultra-high-performance inertial navigation system, will be fitted to the Airbus A400M military airlifter, but it will also conform to civil aviation standards. Fabrice Delhaye, sales director of the Navigation department, confirms that the objective for Sagem Défense Sécurité is to gain access to new markets: “GADIRS is just a first step. In the near future we are going to introduce a new technology, hemispherical resonating gyros, promising gains in civil aviation. This is a revolutionary technology that doubles the reliability of inertial units, making them ITAR Free, meaning that it can be exported without needing special authorization from the US government. This system will immediately allow us to join what are still the only other suppliers of civil aircraft navigation equipment, Honeywell and Northrop Grumman (formerly Litton).”

Unequaled flight safety

This hybrid navigation system, combining normal guidance with secure (anti-override) military GPS, ensures that the aircraft flies along a virtual corridor 30 to 40 meters in radius, and will continue to do so in the event of an internal failure (electronic breakdown) or an external failure (GPS network). “It is a system that guarantees the exceptional level of integrity,” explains Hervé Blanc, director of Navigation programs. The secret lies in the expertise of Sagem Défense Sécurité’s engineers, who have perfected integrity algorithms able to detect low-frequency or long-term drift. Because they are particularly difficult to quantify and detect, these errors are often excluded from the analysis. Current detection algorithms focus essentially on clear faults, ignoring the more subtle errors that often pass unnoticed when they develop very gradually. Faults like these can become dangerous only when their detection, or failure, is delayed. With GADIRS, these risks are substantially reduced.

A wide range of missions

Such is the integrity of the system that aircraft can undertake low-altitude flights with a high level of safety, even over steep terrain. Landing at the bottom of a deep valley is no longer a high-risk undertaking. GADIRS also makes instrument approaches safer, even at night and in difficult weather conditions, or when landing on very basic, unprepared airstrips. The A400M will thus be capable of a wider range of missions, from military resupply to humanitarian rescue operations. “This makes it possible to conduct operations anywhere, in almost any weather and at night,” explains Fabrice Delhaye.

Sagem Défense Sécurité, which already had the necessary experience and skills, took just a few months to bring together a multidisciplinary team of 150 experts to develop GADIRS. They were already well accustomed to military requirements, but had to go a step further to accommodate the demands of Development Assurance Level A (DALA), needed for civil certification. The team was able to successfully design this system, drawing on proven expertise in internal systems and the methodologies needed for the development of critical systems.

THE A400M, A NEW-GENERATION MILITARY AILIFTER

In 2003, seven European countries launched the design of this new military cargo aircraft, built by Airbus Military as prime contractor. The A400M will have a range of 4,540 kilometers (2,450 nautical miles) carrying a 30 metric ton payload, or 6,575 kilometers (3,550 nautical miles) with a 20 metric ton payload. Cruising at 36,000ft and 460 mph (about 400 knots), its performance will equal that of jet cargo aircraft. But its true strength is that it will retain the ability – essential in tactical military aircraft – to operate from rough fields and airstrips. The first flight is scheduled for 2008 and delivery of the first production units for 2009. Each aircraft will be fitted with three Sagem Défense Sécurité inertial guidance systems. Numerous other Safran Group companies are involved in this program.

G. SEQUEIRA-MARTINS
I think that one of the reasons for the CFM56’s success is that it is based on a very simple worksplit. First of all, the work is physically split in two and each partner is responsible for its own parts and modules. This applies across the board, from design and development to engineering and production. Then there are two assembly lines – one in France in Villaroche and one in the United States in Cincinnati (Evendale plant) – serving the two customers Airbus and Boeing.

This relation has lasted for 33 years so far. Given its great success, it makes a lot of sense for us to continue teaming up.

Beyond the present 50/50 cooperation on the CFM56, do you have a project underway to address the needs of the next generation of single-aisle airliners?

In fact, the future in terms of an actual engine may seem many years away, but we are already working together on the post-CFM56 generation. We expect both Boeing and Airbus to develop replacements for their 737 and A320 families, and we realize that for our joint venture to continue to be successful, we need to develop the technologies and products to meet their requirements.

Given all the important performance characteristics that will distinguish A CFM56-powered airplane takes off somewhere in the world every three seconds – and every ten days, the CFM56 engine fleet logs an extra 1 million flight-hours! Building on their success, the two companies are already hard at work on the next generation. GE Aviation’s President and CEO Scott Donnelly kindly agreed to tell us more about this partnership, which has become a textbook case of cross-border collaboration.

Safran magazine: You’ve already had a fruitful partnership with Snecma on the CFM56 for more than 30 years. What is this partnership all about?

Scott Donnelly: It reaches back to the early seventies when Snecma started as a subcontractor on the General Electric CF6-50. Snecma then became a risk and revenue sharing partner on the CF6-80C, and its subsequent variant, the CF6-80E. In the early 1970s, there emerged a need for an engine in the 10-ton thrust class. Snecma defended this idea, and in 1974 reached an agreement with GE to develop this type of engine.

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What about GE and Safran’s partnership on large engines? GE and Safran have a long history of working together on larger engines. Snecma and Techspace Aero have a stake in the GE90 of almost 25%, and Safran also contributes to the GP7200. As for the GEnx, Snecma decided early on to remain focused on its current programs and available resources, because we were already starting to talk about the next generation of smaller engines. However, Techspace Aero is participating in this engine program.

We are also still talking with Airbus to determine whether there is an engine that GE could design for the A350, and our engineering teams are trying to determine the feasibility of doing that. If and when we did that, of course Snecma would be – as they have always been – one of our partners that we would talk to about participating in such an engine.

In view of current developments in geared-fan engines, what do you think about this new technology? A geared fan is not a new idea. This type of engine has been discussed for a long time and there are sound reasons for us not to favor it. If you look at a turbofan and ask yourself why this technology has been so successful, it is because of its fundamental simplicity and the elimination of metal-to-metal contact. In comparison, what bothers us about geared fans is that you’re trading away all that turbofan simplicity and then taking all that energy, some 20,000 to 30,000 horsepower, just to push it back through metal-to-metal gears. This is highly illogical from the standpoint of both reliability and durability.

What the customer cares about is getting better economics in both fuel burn and maintenance costs. For the coming decade we can do a turbofan that offers superior performance in both these areas. When you talk about a geared fan, there is risk, but no reward. With the investments we are making, we will be able to deliver the fuel burn without introducing the risk.

With more than 17,000 engines in service, the CFM56 is undoubtedly the most successful engine in the history of commercial aviation. It powers airplanes carrying nearly 3 million passengers a day. Our long-standing partnership with General Electric continues to bear fruit, as shown by the latest figures: in 2007 we booked orders for 2,700 engines, setting a new record. But we can’t afford to rest on our laurels, which is why CFM International is now focusing its energy on the future. For the last five years, teams from CFM partners Snecma and General Electric have been working on the research & technology program Leap56 (Leading Edge Aviation Propulsion). The goal of this program is to identify and test the engine technologies needed for the next generation of single-aisle jetliners. It raises the bar very high indeed.

In addition to reducing fuel consumption, noise and nitrogen oxide emissions, research teams are investigating ways of significantly cutting maintenance costs and increasing engine life. Technology-environment tradeoffs: A decision must be made between the two main options: an architecture based on disruptive technologies, or one similar to current engines. The application of a truly disruptive technology would enable a significant reduction in fuel consumption, and therefore in carbon dioxide (CO2) emissions. Safran is contributing its considerable expertise to this research, and has already developed technologies that differ radically from current approaches. For example, it has developed fan blades using 3D woven preforms, and nozzles based on ceramic matrix composites.

Environmental concerns are a central part of all technological progress. As a manufacturer, we have to find the best tradeoff between technological performance and environmental protection. Of course, this concern didn’t just spring up overnight, and we have already made tremendous strides in this area. Our current airplanes are significantly less fuel hungry and noisy than the previous generation. Just to take one example, a modern plane consumes less than 3 liters of jet fuel per passenger per 100 kilometers. But this is only one stage in the process. Safran fully agrees with the objectives defined by ACARE, and is one of the leaders in the Clean Sky program.
Your sixth sense onboard.

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