



# one<sup>1</sup>

TEAM - BUSINESS - FUTURE

SURVEY

**TELL US WHAT  
YOU THINK  
ABOUT ONE!**

IN THIS ISSUE

## CONNECTION

Gennevilliers:  
fanning the future. **P. 06**

## STORY

CFM56 to LEAP:  
A giant step forward. **P. 24**

## VISION

Interior design...  
airborne style. **P. 36**

## ONE TEAM

P. 4

### At a glance

The latest news about our teams

P. 6

### Connection

Gennevilliers, fanning the future

P. 11

### Snapshots

Around the world of Safran

P. 14

### Commitments

Women@Safran:  
28 get-togethers, and counting!

P. 16

### Insights

Internal mobility,  
a powerful career driver

P. 18

### A day with...

Jérôme Metchede,  
Field Rep for Global Turbine Asia

## ONE BUSINESS

P. 20

### At a glance

Safran's successes

P. 22

### On the Road

Aircraft Interiors Expo  
in Hamburg



Top: Assembling a LEAP-1A fan case on the rolling line at the Villaroche plant near Paris. Bottom: ZEO, the Safran cabin design studio.

P. 24

### Story

CFM56 to LEAP:  
A giant step forward

P. 28

### Success

The beating heart of  
an airline

P. 30

### Best practices

Augmented reality  
gets real

P. 32

### Scan

A deep dive  
into high tech

## ONE FUTURE

P. 34

### At a glance

News about our main  
R&D programs

P. 36

### Vision

Interior design...  
airborne style

P. 40

### 3 questions for...

Valentin Safir, CEO of  
Safran Engineering Services

P. 42

### Did you know?

Modular seats reshape  
our offering

**Publication director** : Pascale Dubois. **Editorial director** : Alexandre Keller. **Editor-in-chief and project coordinator** : Morgane Palacios. **Written by** : Jean-Pierre Alési, Alexia Attali, Angélique Brandan, Clémence Caillet, Florence Clotuche, Christopher Constans, Caroline Coudert, Benjamin Damsé, Fabienne Lataillade, Dominique Lévy, Ségolène Litterae, Laure Monge, Warel-Malick Ontala, Elodie Pages, Marie-Hélène Péguilhe Diana Roza, Salomé Succar, Mélodie Susini.

**Conception et réalisation**: **BABEL** Photo: Cover: A. Daste / Safran - Contents: A. Daste / Safran - Edito: A. Detienne / CAPA Pictures / Safran - p.4: A. Daste / Safran - p.5: F. Bukajlo / CAPA Pictures / Safran, F. Lataillade / Safran, A. Kachkaev / Safran - p.6-7: A. Daste / Safran - p.8-9: A. Daste / Safran, C. Sasso / CAPA Pictures / Safran, A. Daste / Safran - p.10-11: P. Stroppa / Safran, T. Mamberti/ Safran - p.12-13: J. Lutt / CAPA Pictures / Safran, T. LEGERON / Safran, A. Desclos / Safran, A. Larson Photo / Safran, Bnpix / Safran, Bnpix / Safran - p.14-15: Bnpix / Safran, P. Soissons / Safran - p.16-17: J. Lutt / CAPA Pictures / Safran, Bnpix / Safran, R. Bertrand / Safran, B. Vallet / Safran - p.18-19: R. Waller / CAPA Pictures / Safran - p.20: F. Rogozienski / CAPA Pictures / Safran - p.22-23: A. Daste - p.24-25: Airbus, A. Daste / Safran - p.26: Freelance's l'agence / Safran - p.28: Airbus S.A.S. 2019 - p.31: C. Abad / CAPA Pictures / Safran, P. Boulen / Safran - p.32-33: Freelance's l'agence / Safran - p.34-35: J. Lutt / CAPA Pictures / Safran - p.36-37: A. Daste - p.39 : A. Daste / Safran, T. Smithson / Safran, R. Looij / Safran - p.40: A. Ollier / Safran - p.43: Freelance's l'agence/Safran - p.44: Win-Win.com / Safran **Printer**: Imprimerie Vincent. The articles and illustrations in this publication cannot be reproduced without prior written authorization. CFM, CFM56, LEAP and the CFM logo are registered trademarks of CFM International, the 50/50 joint company between Safran Aircraft Engines and GE.





### **Healthy Finances to Support Investments**

With revenue exceeding 21 billion euros, operating earnings of over 3 billion euros and low debt load, we have every reason to be pleased with Safran's financial results in 2018. Success at this level means we can set very ambitious goals for 2019 and beyond... without lowering our guard of course, since that's the prerequisite for all progress. Exceeding our initial objectives, these strong results allow us to reward everyone's efforts and also shape our future by bolstering our ability to innovate for our customers in the aerospace and defense markets. Our excellent financial health means we enjoy substantial leeway to invest in R&D, especially fundamental research, as well as in our production capacity to keep pace with growing demand in our markets. Our future, both industrial and technological, is built on our ability to use financial resources to fuel innovation and operational excellence, while still keeping costs under control. That's how we can continue to fulfill our mission, namely to help make the world a safer place, where travel is even more reliable, comfortable and environmentally friendly. In closing, I would like to extend my warm thanks to all for your unflagging commitment. I hope you enjoy reading the fourth issue of our in-house magazine.

**BERNARD DELPIT,**  
Safran Chief Financial Officer





**ONE  
TEAM**

# DEVOPS

◀ Safran Analytics has applied a new working method, dubbed DevOps, since 2018. The basic concept is to combine the expertise of Analytics and IT teams on the development of operations and software. Created to address the increasing use of automation, this simple and agile approach allows us to break down barriers, shorten lead times and improve both productivity and competitiveness.

## OPERATIONAL EXCELLENCE: THE CHALLENGE

At the end of 2018, Safran Helicopter Engines kicked off a new training hub, called DEF1, to develop employment and training in the southwest of France. This hub will provide educational tools such as augmented and immersive reality to different user groups and manufacturers.



## LEADERSHIP CHALLENGE IN SARASOTA

At the Leadership Challenge organized by Safran Electrical & Power in Sarasota, Florida, managers submitted a total of 65 innovative ideas. Inspired by challenges on social media, this initiative encouraged the buy-in of management teams to continuous improvement. The watchword throughout the challenge was “Managing by Example”.

## NEW HSE POLICY

The members of Safran’s Executive Committee signed an agreement for the Group’s new health, safety and environment (HSE) policy on February 18, 2019. Safran has signaled its commitment to achieving world-class HSE performance, while improving Group-wide maturity in these areas.



## SAFRAN DAYS: NO. 3 ALREADY

The special days organized by Safran to welcome new hires are going global. Safran Days (modeled on Safran Discovery Days) are now organized locally for Safran’s international staff, with events in Morocco, Russia and China. They allow new hires to expand their network and hear strategic insights from experts, including members of the Executive Committee. Safran Days 2019 will be held in Moscow.







FRANCE

# FANNING THE FUTURE

**The future of Safran is being written in Gennevilliers, a suburb south of Paris that is one of the Group's legacy sites and also home to our new research center for advanced engine turbine blades.**

*"Safran's facility in Gennevilliers reflects the Group's unrivaled expertise and its proven know-how in the technologies underpinning turbine engines and the foundries needed to build them,"* said Florence Parly, French Minister of the Armed Forces, at the inauguration of this new advanced turbine blades research center on February 6, 2019. Ms. Parly had previously visited Safran Aircraft Engines' foundry at this site, accompanied by Ross McInnes, Chairman of the Board of Safran, Philippe Petitcolin, Chief Executive Officer, Olivier Andriès, CEO of Safran Aircraft Engines, and Reiner Winkler, Chief Executive Officer of MTU Aero Engines.

**"WE'RE COUNTING ON YOU"**

February 6th was in fact the occasion for a dual celebration. Florence Parly was also



› there along with her German counterpart, Ursula von der Leyen, to set an official seal on the partnership between Safran and MTU Aero Engines to design a new engine for the new-generation fighter (NGF), part of the Future Combat Air System (FCAS) program. “Here in Gennevilliers, you are shaping the future,” said Ms. von der Leyen in her speech, given in French, English and German. “The friendship between France and Germany reflects our commitment to building the future together. Defense and security are two keys to this collaboration. We’re counting on you, and we have every confidence in your excellence.”

The FCAS program was jointly launched in 2018 by France and Germany. It will feature a new-generation fighter (NGF), slated to replace the currently deployed Rafale and Eurofighter towards 2040. Dassault Aviation and Airbus were chosen to design the new aircraft, while the engine will be designed and built by MTU Aero Engines and Safran. It will obviously benefit from all the technologies developed by this new research center.

*“The turbine blades are the stars of tomorrow’s aircraft,”* said the French minister in her remarks. *“These parts play a critical role in engine performance and service life. Perfecting these parts will allow us to achieve unprecedented performance and also keep our through-life maintenance costs under control. What’s more, all technologies developed for military applications will be used on commercial engines, improving their performance and reliability. These advanced technologies flow through to boost our competitiveness, while also increasing*



*our chances for export success and employment at Safran.”*

#### **A PARTNERSHIP ANCHORED IN EXCELLENCE**

Through this partnership, Safran and MTU Aero Engines will team up on engine development, production and support. Responsibilities are split according to the partners’ respective areas of expertise, in accordance with the “best athlete” principle. Safran Aircraft Engines will take charge of engine architecture and integration, as well as the hot section (combustor, high-pressure turbine, afterburner), while MTU Aero Engines will be in charge of the low- and high-pressure compressors, the low-pressure turbine and services.

According to the program timetable, the development of aircraft and engine demonstrators, used to validate basic concepts, will start in 2019 and culmi-

**“The turbine blades are the stars of tomorrow’s aircraft. They play a critical role in engine performance and service life.”**

**FLORENCE PARLY**  
French Minister of the Armed Forces

nate in 2025. The primary aim is to develop a higher-thrust, longer-life engine for the Rafale’s successor.

#### **PUSHING BACK THE LIMITS**

The high-pressure turbine for this upcoming French-German powerplant, reflecting Safran’s expertise in military engines, will operate at about 1,800°C, largely surpassing the melting temperature of the metals used to make the blades! Innovations in several key areas will allow us to meet this daunting challenge: materials, via research into ceramics and new single-crystal metal alloys; technologies, using additive manufacturing and improved thermal coatings; and design, via opti-





**Page 8:** Defense ministers Florence Parly (left) and Ursula von der Leyen. **Above:** Philippe Petitcolin and Reiner Winkler sign the collaboration agreement between Safran and MTU Aero Engines.



## SEGUIN BROTHERS: VISIONARIES

**Safran is the world's oldest aircraft engine manufacturer.** Today's Group is heir to the audacious vision of the Seguin brothers, who set up their first workshop in Gennevilliers in 1895, then founded the Société des Moteurs Gnome. The first Gnome Omega rotary engines were developed in 1908. By the end of 1913, a record 1,400 had been sold. From 1909 to 2014, Gnome rolled out 3,638 engines, fully one-third of the global market — and that was only the beginning!

mized geometries and even more sophisticated cooling circuits.

*“For the FCAS, we will have to push back the current limits by incorporating a number of disruptive technologies,”* pointed out Safran CEO Philippe Petitcolin. *“We have invested some 20 million euros in our new advanced turbine blades research center, which will be a major advantage in achieving this level of excellence.”*

### SPECIFIC OBJECTIVES

Our research & technology center, Safran Tech, oversees this new turbine blades research center. Its roadmap couldn't be clearer, as Hughes Joubert, head of the new center, explains.

*“We boast a fully integrated team spanning design to production; there are about thirty staff members, including one-third doctoral candidates. We also have all the machinery and equipment needed to perform casting operations, including manufacture of cores and molds, melting all metals, drilling small holes in the blades and parts inspection.*

*Right from the time we start concept studies, we integrate simulated pro-*

*duction procedures in the design process. We control all of these processes using advanced digital technologies, including big data analysis. We have also formed close ties with specialists in ceramic materials and thermal coatings. Casting is a technology that's over 5,000 years old! Mastering this process is critical for success in aerospace, not to mention a key to military aircraft engine performance, which in turn protects national independence. It's just as important for commercial aero-engines, since it helps enhance performance and availability, while reducing production and maintenance costs.”*

The turbine blades research center is



**New machinery and equipment** in the advanced turbine blades research center.



**Preparing wax models**  
at the Gennevilliers foundry.

**“Being located next to Safran Aircraft Engines’ teams is a real advantage, since we are constantly enriched by feedback from production teams.”**

**VIRGINIE JAQUET**

Materials & Processes manager at the advanced turbine blades research center

› housed in a new building spanning some 3,000 square meters (32,400 sq ft). The 30-strong team of engineers and doctoral researchers works closely with Safran Aircraft Engines’ center of excellence in turbine blades and Safran Helicopter Engines’ facility in Bordes, southwest France.

The blades developed by this new center will be gradually incorporated on the Rafale’s M88 engine, for which several upgrades are currently under consideration. In addition, the research center is investigating new technologies for commercial engines and helicopter turboshaft engines (Aneto® and Arrano®).

*“Being located next to Safran Aircraft Engines’ teams at Gennevilliers is a real advantage,”* notes Virginie Jaquet, Materials & Processes manager at the research center. *“Since our main customer is the turbine blades center of excellence, we are constantly enriched by feedback from production teams, who are fully aware of all issues in this area. It also makes it easier to transfer*

*the basic building blocks we develop here to the production sector.”*

With the inauguration of the new research center, the Gennevilliers plant continues to shape Safran’s future. Following the inauguration, Safran CEO Philippe Petitcolin described the road ahead: *“Safran’s employees are ready to rise to the challenge of the FCAS program and its new-generation fighter, slated to enter service towards 2040. For people, that’s a long time in the future, but for a military aircraft, it’s just around the corner!”* ■

# AROUND THE WORLD OF SAFRAN

Introducing a team and six individuals from Safran companies, for a quick look at their career paths and vision of Safran.



## Together for the 500th M88

Everyone who contributes to the production of the M88, the engine that powers the Dassault Aviation Rafale fighter, got together in February at our plant in Villaroche, near Paris, for the delivery of the 500th engine, which will be used by the Qatar Emiri Air Force. Safran Aircraft Engines CEO Olivier Andriès congratulated everybody at Safran who contributes to this program, saying, *“The M88 is a magnificent powerplant, and one we can be proud of. Few companies in the world today are capable of producing an engine like the M88.”*



## Leila Benmammour

Production Engineering Quality Assurance engineer,  
Safran Transmission Systems

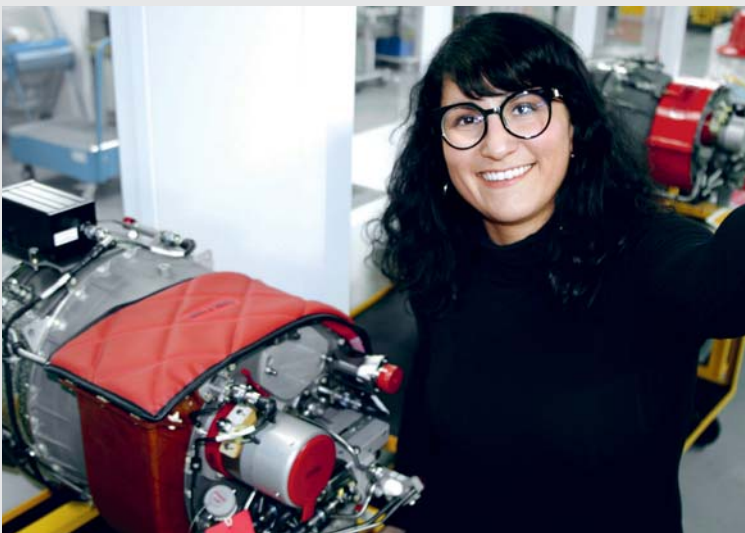
“I make sure that our customers don’t experience quality shortfalls, by implementing the monitoring methods needed to ensure that Safran’s production engineering requirements are met. I also help our people apply various methodologies : risk analysis while also integrating lessons learned.”



## Fabien Guillot

Micromechanics technician,  
Safran Electronics & Defense

“I help armed forces maximize their battlefield vision with our JIM Compact™ infrared binoculars. My job entails special laser welding and micro-wiring procedures for the infrared detection modules at the heart of these binoculars. To do this job, you have to be meticulous, patient and professional.”



## Manuela Almeida

Engine assembly and balancing manager,  
Safran Power Units

“I’m in charge of the final assembly unit at Toulouse. We assemble and test engines prior to delivery. Each day means new challenges. What I like about my job is managing a multidisciplinary team all working towards the same objective: delivering quality for the benefit of our customers.”



## Janelle Bronaugh

North America HSE Manager,  
Safran Electrical & Power

“Achieving the Gold level for the HSE Standards for four of my largest sites was not an easy task. But with management support, competent HSE professionals, employee involvement, and with all levels of the organization working together with the right attitude, we were able to obtain this great milestone. Safety doesn't happen by accident! It takes work!”

## Graeme Klim

Hyperloop Engineering Lead,  
Safran Landing Systems

“Inspired by my engaging internship in Toronto, I now work in Vélizy, near Paris, where I lead a unique and innovative company-wide project. As Hyperloop program lead engineer, I get to apply my passion and drive to develop new landing gear technologies together with some of the best and brightest Safran has to offer!”



## Sébastien Razakarivony

Research engineer, Safran Tech

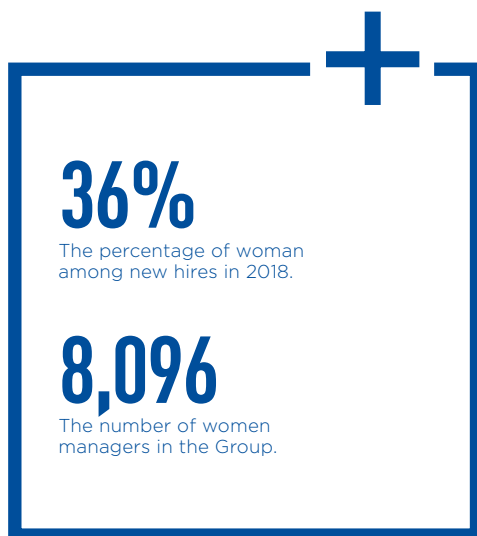
“After earning a PhD in machine learning while at Safran Electronics & Defense, I have now been working on data analysis for the last four years at Safran Tech. I love having the opportunity to work on all Safran products, and being in contact with each of our companies. For the moment, I'm studying helicopter operating data along with Safran Helicopter Engines.”



# WOMEN@SAFRAN: 28 GET-TOGETHERS, AND COUNTING!

Rolled out in 2016, the Women@Safran initiative hosts lunch gatherings for female members of the Group to share their experiences. High-profile speakers are invited to lead the debate by presenting their own career paths, challenges and achievements. The overriding goal is to encourage women to actively shape their own careers.

**Corinne de Bilbao, chairwoman and CEO of GE France**, during a lunch gathering at the Safran Campus, late 2018.





Émilie Cappone et Régine Vadrot, flight operations manager at Airbus, during a Women@Safran gathering in Toulouse.



## SET GOALS, BUILD NETWORKS

### ÉMILIE CAPPONE

Black Belt,  
Safran Engineering Services

**You've been part of Women@Safran since its launch in Toulouse in 2017. Tell us why.**

Presenting career women as role models is important to helping other women plan ahead. It proves that women can build a successful career without sacrificing their personal life. These

discussions spark a lot of debate. Our guest speakers tend to be strong personalities, capable of handling heavy workloads. In some cases, their success stems from a chance meeting with someone or a particularly caring manager.

### What do you get out of it?

I've learned about the role of women in other

organizations, which varies a lot. Women@Safran isn't about revolutionizing the company; the main aim is to enable women to share their experiences. It helps them open up to new ideas and allows them to network inside and out of Safran. Our guest speakers, who're often involved in local NGOs, are always willing to share their contact details!

### INSPIRING JOURNEYS

Set up in 2016 by Ghislaine Doukhan, head of Safran Analytics, Pascale Dubois, Executive Vice President, Communication, Sabine Haman, head of Human Resources at Safran Aircraft Engines, and Hélène Moreau-Leroy, head of the Zodiac Aerospace integration project, Women@Safran has proven highly successful. In fact, several other Group companies in France and the United States have also adopted the initiative, soon to be joined by Morocco. The gatherings, held every three weeks at the Safran Campus in Massy, are open to women in management roles aged 35 or over. A guest speaker is invited to talk about her experience and answer questions. Chosen for their outstanding careers and rich and varied experi-

ences, these women are a great source of inspiration. Previous speakers have included Frédérique Bedos, founder of the non-governmental organization (NGO) Projet Imagine, Anne Brachet, Executive Vice President, Air France-KLM Engineering & Maintenance, and Ann Hindry, curator of the Renault art collection. These remarkable women all have one thing in common: they never let prejudice stand in their way.

### DIVERSITY, AN ASSET FOR THE GROUP

*"When I was appointed head of purchasing for Europe at GE Power, people often mistook me for an assistant! The head of our branch really helped by coming along to my first meetings to endorse my role,"* said Corinne de Bilbao, chairwoman and CEO of

GE France, at a lunch gathering in November 2018.

Anne Brachet echoed this sentiment: *"There aren't enough women in industry and there's a lack of all types of diversity, [...] and yet diversity undeniably helps things flow more smoothly."* All of these women overcame hurdles to establish themselves on the fast track and earn recognition from their peers. Through its regular gatherings, Women@Safran shows that determination, initiative, skills and personal qualities are the only things that really matter in building a successful career. ■

# INTERNAL MOBILITY, A POWERFUL CAREER DRIVER

For Jean-Luc Bérard, Executive VP, Human Resources, there's no doubt about it: "Career mobility is a great investment for our employees and our Group." Every year, more than a thousand employees take advantage of internal mobility opportunities. We asked four of them to share their experience.



## PHOEBE HAMPTON

Vice President, Human Resources  
at Safran Cabin, formerly head of HR  
at Safran Electrical & Power

"This transfer is a great opportunity to contribute to Safran's future following the integration of Safran Cabin sites into the Group. I plan to capitalize on the experience built up over my career in similar operations, but for the moment, I

must familiarize myself with the entity's people and activities. Having said that, I've already got a few projects in mind, like introducing the Group's commitments and HR maturity grid to my team to facilitate their embrace of best practices, HSE standards and the Safran leadership model. Because of Safran Cabin's warm welcome and the employees' pride in their jobs and products, I'm especially enthusiastic about the idea of creating a dynamic organization and robust processes, so we can meet our business objectives and develop people's talent." ■

## ADRIEN PALLIX

Product coordination engineer,  
Safran Transmission Systems,  
formerly Safran Aircraft Engines

"After seven years at Safran Aircraft Engines, I felt it was time to take on new challenges at another Group company, but still in the same line of business. So, two years ago, I transferred to Safran Transmission Systems to work as CFM56 and TP400 product coordination engineer. This move has given me the chance to develop specific skills and a deeper technical understanding of the issues involved in power transmission. Over the past few months, I have mainly focused on overseeing service events on the LEAP engine, which involves coordinating technical, industrial, purchasing, quality and product support activities. The main aim is to ensure the complete satisfaction of our customer and partner, Safran Aircraft Engines. Having already worked there is a huge advantage: I know the company's requirements and I can tailor solutions to match them." ■







#### **RACHAD ARBEL**

Chief Information Officer (CIO) at Safran Cabin, formerly CIO at Safran Helicopter Engines

“I recently joined Safran Cabin as Chief Information Officer. My task is to work with everyone at Information Systems and Information Technology (IS/IT) to build an effective and efficient IT department that is future-focused, committed to its customers and fully integrated with Safran IT. As well as a move abroad, this has meant a change in workplace, approach and operating methods — and I'm really excited about the challenges ahead! HR has provided fantastic support, helping me quickly adapt to my new environment. They made every effort to ensure the transfer went as smoothly as possible, from the initial preparations through to my settling in here in California. Internal mobility at Safran is a wonderful opportunity and a powerful career driver. The Group offers an outstanding professional development support package and I strongly recommend it to anyone thinking of an international career move.” ■



## **FIRST MULTI-COMPANY RH FORUM**

A two-pronged success for internal mobility! In September 2018 Safran Nacelles hosted a forum at the Paris-Saclay site to promote mobility opportunities within both the company and the Group. Attended by 150 people from Safran companies across the region, the event boosted internal recruitment and helped grow our future talent pool.

#### **ANNE-LAURE LESCAUT**

Engineering Project leader - M&P obsolescence coordination, Materials & Processes, Safran Landing Systems, formerly with Safran Aerosystems

“At Safran Aerosystems, I was responsible for coordinating teams working on European REACH [chemical substances] regulations and eco-design. Because my new role is closely related to my previous activities, my transfer to Safran Landing Systems went without a hitch. I'm now in charge of managing materials and processes obsolescence. As before, this involves synchronizing teams working on a common, highly cross-functional issue, but it's more technical and more product and customer-focused. My new role has enabled me to learn about different types of equipment, involving new technical challenges, and operate in an exciting international environment. Internal mobility at Safran is a brilliant opportunity to shift your career into higher gear!” ■



## SAFRAN HELICOPTER ENGINES

# Jérôme METCHEDE

**Field Representative, GTA (Malaysia)**

Jérôme has been a Field Rep at Global Turbine Asia (GTA), a Malaysia-based joint venture with Safran Helicopter Engines, for the last four years. He has already held the same job in France and Brazil, working with helicopter manufacturers and operators.

This morning I welcome customer Helitech Aviation Services for our annual technical and business review. Their fleet includes the Airbus Helicopters H120 and H155 machines, powered by our Arrius 2F and Arriel 2C2 engines, respectively.

9:00 AM



Along with technicians from GTA, we review the work that needs to be performed on an Arrius 2F engine recently sent in by a customer.

11:00 AM



I discuss the Malaysian civil aviation authority's new requirements with a quality assurance manager.



12:00 NOON



14:30 PM

## OUR FIELD REPS RECOGNIZED!

For the 7<sup>th</sup> time in 9 years, Safran Helicopter Engines' Field Representatives topped customer surveys by the magazines *Vertical* and *Professional Pilot*. This international team works closely with the company's facilities in France, the United States, Brazil and Singapore.

While visiting Hammock Helicopter's maintenance center, I advise our customer on the checks needed for our engines before the helicopter returns to service.



16:00 PM



17:30 PM

**Above:** Valérie Patuel, Chief Executive Officer of GTA, explains Safran Helicopter Engines' roadmap for 2019-2021.

**Left:** The Malaysian army makes a surprise visit to get more information on how a specific tool is used.



**ONE  
BUSINESS**

# RYANAIR

Low-cost carrier Ryanair has chosen Z110 economy class seats from Safran Seats for its Boeing 737 MAX fleet, with 110 aircraft to be outfitted, plus an option on 75 more.

# BOEING

## **BOEING CHOOSES SAFRAN WIRING HARNESES FROM FOR ITS NEW 777X AND RENEWS THE CONTRACT FOR THE 787 DREAMLINER.**

*"Our people's commitment to excellence drives impeccable quality, on-time deliveries and unrivaled support services,"* says John Alter, head of the 787 program at Safran Electrical & Power. Safran is now the exclusive supplier of wiring for the 777X, encompassing design, production and certification.

# 70,000

## **SAFRAN LANDING SYSTEMS, GLOBAL LANDING GEAR LEADER**

Some 70,000 landings are made daily worldwide by airplanes using landing gear from Safran Landing Systems.

The company is a supplier to all leading planemakers, including Airbus, Boeing, Bombardier and Dassault Aviation.

In 2018, it delivered more than 1,350 landing gear sets. Safran Landing Systems is the world leader, with its landing gear now underpinning nearly 27,000 airplanes.

## A NEW JOINT VENTURE, INITIUM AEROSPACE

On February 13, 2019, Boeing and Safran Power Units unveiled the name of their 50/50 joint venture for auxiliary power units (APU), Initium Aerospace.

The APU supplies electrical power to start a plane's jet engines and power its systems

while on the ground. Initium Aerospace combines the respective areas of expertise of Safran and Boeing to develop even more competitive APUs.

# SAFRAN AT AIRCRAFT INTERIORS EXPO

In early April, Safran took part in Aircraft Interiors Expo (AIX) in Hamburg, Germany. This annual event is a must for our airline and aircraft leasing firm customers. For our sales & marketing staff, it's a sterling opportunity to talk with the sector's movers and shakers, flair upcoming trends and showcase innovations.

Norman Jordan, CEO of Safran Cabin, and Julie Imbert, Marketing and Passenger Experience Officer. The Cabin Concepts award from the Crystal Cabin Award went to the "Lower Deck Pax Experience Modules", designed by Safran with Airbus.



On the main Safran stand, alongside other companies, Safran Cabin presented its new cabin demonstrator ECOS, its award-winning lower-deck module and various galley equipment items, such as electrical inserts. At the dedicated World Travel Catering stand, the company showed off its brand-new Hybrite S, a light yet robust service trolley.





Safran Aerosystems showcased its RAVE™ in-flight entertainment (IFE) system, data systems and actuation systems. Also on display was the isee™ surveillance camera, along with a ceiling lighting system and a water & waste system.

# 1,408

square meters (15,206 sq ft) for our stand, one of the largest exhibitors.

# 20

years since the first AIX trade show.

# 37

products presented during the show, reflecting Safran's broad expertise in aircraft interiors.

# 150

customers visited the Safran stand this year.



Safran Seats displayed its business class seats, including the Optima®, Versa and Skylounge Core ranges, along with economy, premium economy and domestic first class models. A virtual reality setup allowed customers to see how seats would fit in a complete cabin. Several special customers got a preview of upcoming innovations in a private showroom.

# CFM56 TO LEAP: A GIANT STEP FORWARD

In 2018, LEAP engine deliveries overtook the number of CFM56s rolling off the production lines. The transition from Safran's most iconic aero-engine to its state-of-the-art successor is underway... and getting this transition right is crucially important for the Group!

The A320neo,  
powered by  
LEAP-1A engines.



The CFM56® program had been running for 35 years before we reached a production rate of 1,700 engines a year. This rate was achieved thanks to the success of the 5B and 7B models, which power the Airbus A320ceo and Boeing 737 Next Generation (NG) families, respectively. The LEAP® entered revenue service as the CFM56's successor in August 2016 and should equal this historic production peak just four years after launch!

The fastest-selling engine in commercial aviation history, the LEAP is the latest product from CFM International, the 50/50 joint company between GE and Safran Aircraft Engines. The LEAP-1A powers over half of the A320neo family of airliners from Airbus, while the LEAP-1B is the exclusive engine for all Boeing 737 MAX models. The C919 developed by COMAC in China is

currently at the flight testing stage and is powered by the LEAP-1C. CFM International has set a target production rate of over 2,000 LEAPs a year by 2020. The LEAP still has a long way to go before it matches the 33,000 CFM56 engines delivered to date, making it the world's all-time bestselling jet engine, but in March this year the LEAP passed the milestone of 2,000 produced.

## REDUCING PRODUCTION COSTS

In terms of production and supply chain capacity, the transition from a mature

engine like the CFM56 to a next-generation product like the LEAP is a huge challenge for Safran. It impacted our propulsion business's operating income in 2018, for two main reasons: the ramp-down of CFM56 engine production and a negative margin on LEAP sales, mainly due to the learning curve because of new technologies and materials. Safran Aircraft Engines is doing everything possible to drive down production costs. After reductions of 30% in 2017 and 20% in 2018, costs must be further minimized this year. All Safran >



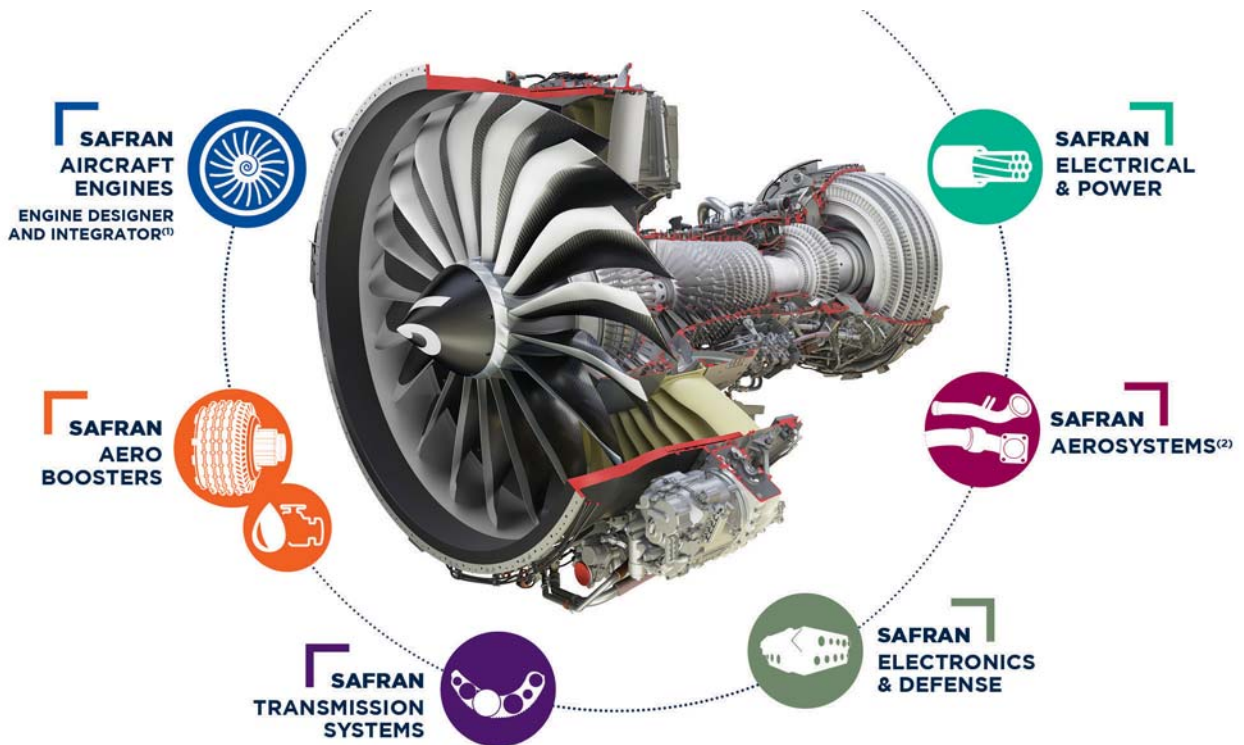


## 1,800 LEAP IN 2019

CFM International is increasing its production rate again this year, with a target of over 1,800 LEAP engines delivered to customers. Efforts will focus on the LEAP-1B, with the production rate steadily rising to more than 30 units a week.

**Top:** Former CFM56-7B fitter Steve Coujandassamy (see p. 27) now works on the LEAP turbine in the assembly shop at the Villaroche plant, southeast of Paris. **Bottom:** The LEAP pulse line at Villaroche.





(1) Through CFM International - (2) Safran Aerosystems' wiring business now under operational management of Safran Electrical & Power.

**Safran Aircraft Engines**  
can rely on solid partners  
among fellow Group companies.

► businesses involved in the program are part of these efforts, along with more than 150 suppliers. These companies provide 75% of the parts for a LEAP engine, amounting to over 70% of its unit value. With the ramp-up in deliveries, any variances or cost overruns could have an impact at Group level. "Our production costs on this program need to be tightly controlled, and quickly, because our ability to meet our economic objectives depends on it," says Olivier Horaist, Safran Executive Vice President, Production and Purchasing.

#### RAMPING UP THE LEAP-1B

On the industrial front, successfully ramping up LEAP production rates is crucially important for Safran. At March 31, 2019 CFM International's order book (including commitments) stood at more than 17,500 engines, equivalent to eight years of production.

The LEAP knocked the CFM56 off the delivery top spot in 2018, with 1,118 LEAPs shipped, versus 1,044 CFM56s, and LEAP assembly rates doubled from the previous year. To achieve these sustained volumes, Safran companies have invested heavily over the last five years, along with our 150 suppliers in 14 countries, including many of Safran's long-standing partners. Safran has built ten new facilities or major extensions to keep pace with the LEAP ramp-up, totaling more than 17 hectares (42 acres)!

#### SAFRAN MEANS SYNERGIES

Safran Aircraft Engines can also rely on solid in-house partners: "We're very lucky at Safran to have several global leaders in their respective fields," says Olivier Horaist (see graphic, above). "These companies have further refined their expertise by working with other aero-engine manufacturers. That's one

of the strengths of Safran companies, as shown by their respective contributions to the LEAP program, grounded in their skills and expertise. Within Team Safran, there are also ways we can boost competitiveness, allowing us to bring production of some parts back in-house. For example, the variable bleed valve (VBV) ducts for the LEAP, which are now produced by Safran Aerosystems. Having these capabilities in-house challenges our suppliers, which gives us real economic leverage in the supply chain."

To produce the LEAP, Safran Aircraft Engines has developed various production and performance management tools, used both internally and with suppliers. These continuous improvement, control and supply chain preparation methods have become Group-wide standards as part of One Safran. At the same time, we have deployed approaches such as closed door

machining — an automated process for fabricating parts in a closed environment. *“The massive investments in Safran’s facilities reflect our commitment to maintaining in-house capabilities for the strategic components of our engine. The LEAP’s future really is in our hands!”* emphasizes Olivier Horaist.

### **CFM56: THE ADVENTURE CONTINUES**

The end of CFM56 first-fit engines doesn’t mean the end of production. Some types of life limited parts — such as turbine shafts and fan disks, for example — will continue to be produced at a sustained rate.

Almost 28,000 CFM56s are still in service worldwide and shop visits (major engine overhauls) are expected to reach a peak in 2025. It’s more than likely that high demand for spare parts will keep our production lines rolling for a number of years to come! ■

**“The massive investments in Safran’s facilities reflect our commitment to maintaining in-house capabilities for the strategic components of our engine. The LEAP’s future really is in our hands!”**

**OLIVIER HORAIST**  
Safran Executive Vice President,  
Production and Purchasing



## **CFM56 EXPERTISE IS A REAL ASSET FOR THE LEAP**

**STEVE COUJANDASSAMY**  
Transfer Project Pilot,  
Safran Aircraft Engines

### **What’s your take on the CFM56/LEAP transition?**

I was previously a fitter on the CFM56-7B, then I moved to the LEAP in 2015 when the first production engines were assembled. Working with the various operating units, I was able to draw on the experience I’d gained on the CFM56 to offer solutions

to some of the teething issues with the LEAP and help implement robust assembly processes. The ramp-up was meticulously prepared, although the actual changeover happened very quickly.

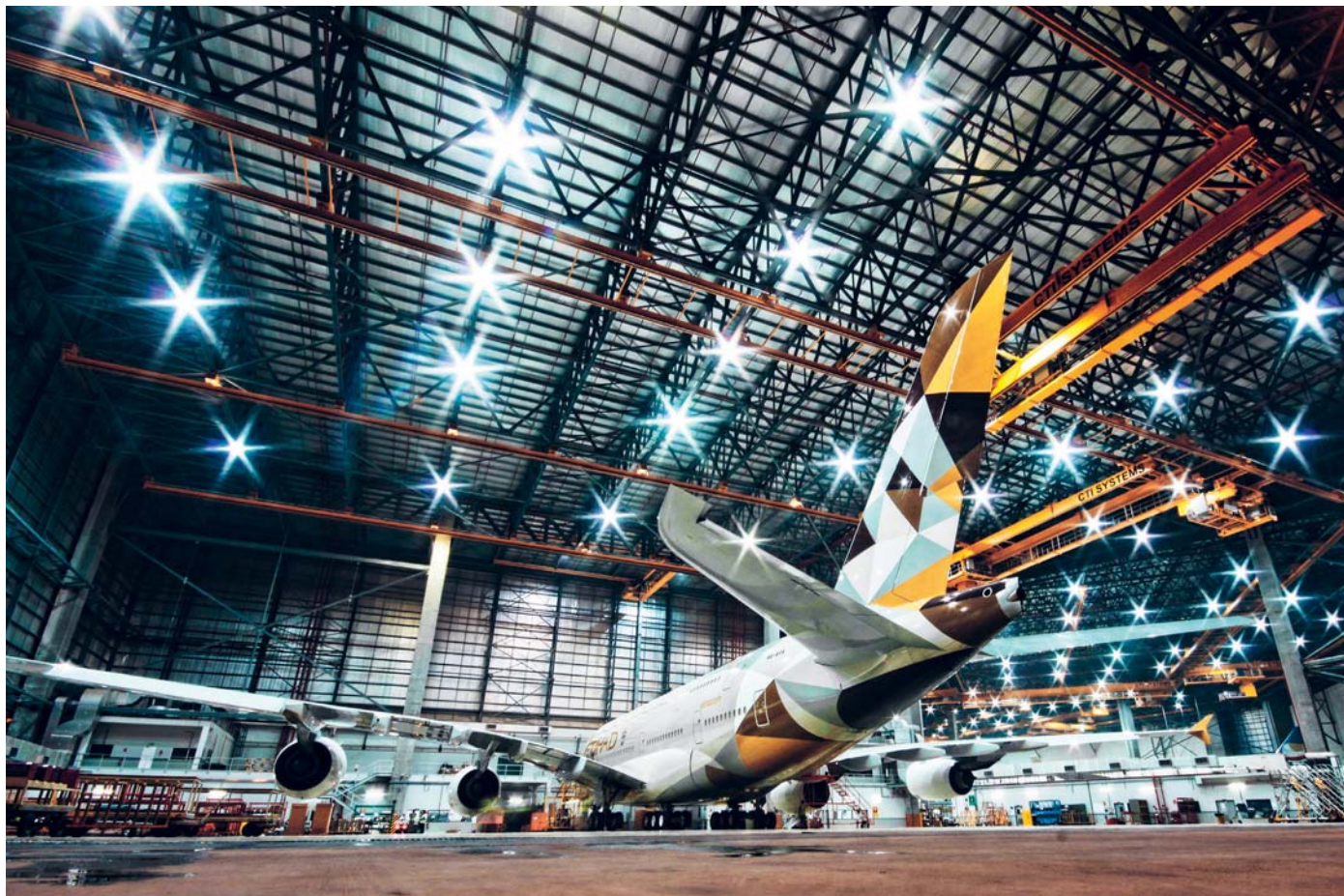
### **How are you stepping up to the challenges of LEAP production?**

LEAP production rates are now higher than anything

we achieved with the CFM56, so all the knowledge we’ve built up is a real asset as we rise to this new challenge. We’ve introduced new technologies to help with assembly, such as Dalmeç lifting arms, pulse lines, rolling lines and robotics, which also have real benefits in terms of HSE and organization.

# THE BEATING HEART OF AN AIRLINE

Knowing our customers inside out is crucially important for Safran Landing Systems. It's also why we created the Secondment Program, which immerses employees in the daily operations of an airline for months. Here's how it works...



An Airbus A380  
at Etihad Airways  
in Abu Dhabi.



## FACTS & FIGURES

- › **2015:** first Safran Landing Systems employee seconded to easyJet.
- › **10** employees have taken part to date.
- › **4** will be seconded in 2019.
- › **30** airlines visited since 2015.

### WALKING IN THEIR SHOES

Gaining a deeper insight into airlines and their requirements helps us offer more needs-responsive products and services, as well as anticipate, innovate and develop new solutions to better meet their expectations. The best way to understand what customers need is to be there and see how they operate from the inside.

That is exactly what Thomas Lepage and Thomas Lacroix did. Thomas Lepage, an engineer at the Safran Landing Systems design office, spent a year with Etihad Airways in Abu Dhabi, while Thomas Lacroix, an engineer at our customer support unit, spent six months with easyJet and British Airways in London.

### PUTTING CUSTOMERS CENTER STAGE

By working directly with airlines, the two engineers understood first-hand the challenges and unpredictable situations they face every day, enabling

them to tailor their technical responses accordingly.

Thomas Lepage commented: *"I learned a huge amount about how Etihad operates and what they need. Because you're physically on-site, you're interacting with people all the time and you can offer more informed advice and proactive technical solutions to help the airline minimize operational disruption and better manage its aircraft. Back in France, I relayed all this to the team, and we're now working to improve our overall quality of service. It's a really constructive exercise!"*

Thomas Lacroix, seconded to easyJet and British Airways, added: *"The program's all about two-way communications and gaining a deeper insight into the issues we encounter on both sides. So while Safran Landing Systems develops and enriches its customer culture, the airline learns more about how we work. It's a win-win arrangement that's helping build long-term relationships of mutual trust."*

### IMPROVING SATISFACTION

For the company, the Secondment Program is also an excellent way of gauging and improving quality of service, which the airlines have readily welcomed. This is reflected in feedback from people like Swaran Sidhu, Head of Fleet Technical Services at easyJet: *"Thomas Lacroix quickly understood our stakeholder setup and who to approach for specific answers to help speed up progress on burning topics. He really embedded into our culture and way of thinking. Our only regret is that the operation didn't last longer than six months!"*

Olaf Ploog, Head of Fleet Development at Etihad, was equally enthusiastic: *"For the introduction of the B787 especially, the support was vital as we experienced issues with the electrical brake system. The direct link with Thomas Lepage was a chance to build a stronger relationship and fast-track the resolution of technical issues. It has proven to be a very effective way of working together for our joint benefit."*

Ten Safran Landing Systems employees have already taken part in this program, and this successful initiative is continuing in 2019, with another four flying in for an extended stay at an airline! ■

# AUGMENTED REALITY GETS REAL!

Safran Nacelles pioneered the use of augmented reality within the Group and now makes its expertise available to other entities through a working group that meets to share experiences and standardize practices. We look at the benefits of this technology, set to revolutionize our production and maintenance activities.

## HOW IT STARTED

In late 2016, Safran Nacelles in Burnley, United Kingdom, adopted augmented reality (AR) as a way to reduce the time taken to inspect composite panels on nacelles for the Airbus A320neo and A330neo. The idea is simple: a robot uses infrared thermography to inspect parts. If the robot suspects a fault, it highlights the area of the panel in question for further verification, making the task easier for operators. This innovation was a world first in non-destructive testing (NDT) and marked the effective introduction of AR at Safran. Two years later, Safran Nacelles implemented an AR system on the nacelle production line for the GE Passport™ engine in Le Havre, France, to help operators visualize the routing of hydraulic circuits and wiring connections. The company's Toulouse plant, which specializes in nacelle-engine integration, adopted a similar system earlier this year for the assembly of wiring harnesses for the A320neo. These first applications are already having an impact, with a reduction in poor-quality rates and learning time (-50%), cycle times (-10%) and the time needed to develop new production procedures (-20%).

## POOLING EXPERTISE

The potential benefits of augmented reality haven't gone unnoticed, and several Group entities are already trialing or adopting it. Safran Aircraft Engines implemented AR on the LEAP engine assembly line in 2017 to help keep pace with the unprecedented production rates. Safran Electrical & Power has also been using AR since 2017 to isolate wiring failures through the inside walls of a plane, without having to dismantle them, significantly

reducing maintenance time. In 2018, Safran Landing Systems started trialing AR at two sites to assist operators with landing gear maintenance. Studies are also in progress at Safran Electronics & Defense for the assembly of gyro-stabilized pods and at Safran Helicopter Engines for the predelivery inspection of engines at the end of assembly. All these initiatives benefit from the expertise built up by Safran Nacelles, which coordinates an AR/VR committee, set up by Safran's Industrial



## AUGMENTED OR VIRTUAL: WHAT'S THE DIFFERENCE?

—

- > Augmented reality (AR) superimposes information on an actual object in real time to make tasks easier for operators in areas like quality control.
- > Virtual reality (VR) generates a full-scale 3D image of one or more objects to simulate an actual situation, such as a maintenance operation.



**Computer-aided assembly** on the LEAP-1A pulse line at the Safran Aircraft Engines facility in Villaroche, near Paris.

department in 2016. Representatives from each entity meet to share successes, discuss difficulties and pool their efforts in all aspects of augmented reality projects, such as the purchase of hardware and choice of software. The goal is to avoid reinventing the wheel each time, and instead capitalize on the experience gained by other committee members, who offer guidance and quickly point to the best solutions. Safran's entities are working with tech startup Diota, which specializes in AR for industry (the Group invested in Diota in 2016 through its investment arm Safran Corporate Ventures).

#### **STANDARDIZING OUR TOOLS**

Twice a year, the Group-level committee holds meetings at local sites using AR in order to discuss specific applica-

tions. Participants at these sessions also work to standardize tools and processes, in line with the One Safran ethos. This year, the committee added representatives from Safran Cabin, Safran Aerosystems and Safran Seats, which are also potential AR users. ■



#### **NICOLAS LEPAPE**

**Virtual & Augmented Reality Manager  
at Safran Nacelles**

Augmented reality is about displaying the right information at the right time in the user's field of view. It doesn't require an "immersive" device, since the information is projected directly onto objects or displayed on a computer screen or tablet. For now, AR is mostly being used in production and maintenance. For example, instructions can be projected directly onto the parts concerned, providing operators with guidance for each task and reducing cycle times and poor-quality rates. The actual gains achieved will need to be accurately measured before pursuing these applications further. Going forward, however, AR could also be used in services to provide remote assistance with a fault, as well as support training.

# A DEEP DIVE INTO HIGH-TECH

A submarine's survivability depends on its stealth. Safran Electronics & Defense has been providing low-observable navigation, observation and surface threat detection solutions for over half a century. With this powerful mix of technologies, we help French navy submarines carry out their missions, including nuclear deterrence, intelligence gathering and escorting the *Charles de Gaulle* aircraft carrier.

Rapid and discreet detection



## NAVIGATION RADAR

### FUNCTION

Day/night surface vessel detection in all weather conditions to avoid collisions.

### FEATURES

Radar signals optimized for low-observability.



## PROPULSION BAY

## EXPORT SUCCESS

Safran Electronics & Defense provides submarine navigation and observation solutions for Brazil, South Korea, India, Sweden and other countries.

Major current prospects include Germany, Australia, Norway and the Netherlands.

## SEANAPSTER COMPUTER

### FUNCTION

Navigation information distribution.

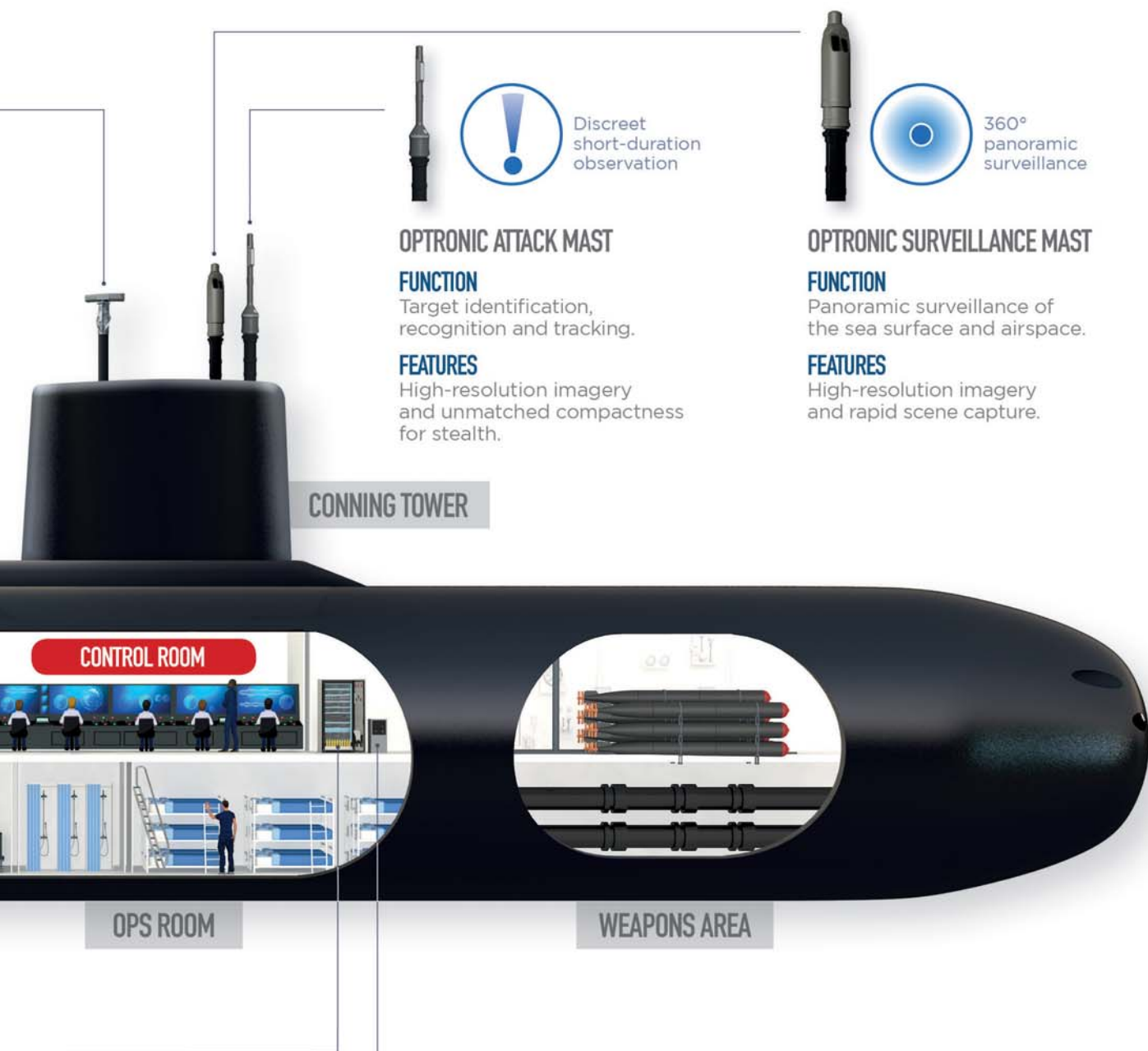
### FEATURES

Gathers, analyzes, integrates and distributes real-time navigation information (position, attitude, speed, etc.) for the submarine's control station, weaponry and other systems.



Real-time distribution





Discreet  
short-duration  
observation

## OPTRONIC ATTACK MAST

### FUNCTION

Target identification,  
recognition and tracking.

### FEATURES

High-resolution imagery  
and unmatched compactness  
for stealth.



360°  
panoramic  
surveillance

## OPTRONIC SURVEILLANCE MAST

### FUNCTION

Panoramic surveillance of  
the sea surface and airspace.

### FEATURES

High-resolution imagery  
and rapid scene capture.

CONNING TOWER

CONTROL ROOM

OPS ROOM

WEAPONS AREA



Extended  
dive  
capability

## BLACK-ONYX™ NAVIGATION SYSTEM

### FUNCTION

Permanent tracking of  
the submarine's position,  
without needing to surface.

### FEATURES

High precision,  
dependability and  
autonomy contributing to  
the submarine's submerged  
endurance.

# ONE FUTURE



### SAFRAN INNOVATION DAY 2019

Nearly 500 people attended the 14th Safran Innovation Day, held at the Paris-Saclay facility. It was a very busy day indeed, during which 40 teams of intrapreneurs, the Group's own innovators and our startup partners pitched their innovations to the jury and presented them on their stands all day long, with demonstrations. One of the highlights was a talk on innovation by Olivier Bas, Vice President of communications agency Havas Paris, followed by the Safran Innovation Awards. Out of the 89 projects submitted, five walked off with awards. Kudos to the teams from Safran Ventilation Systems, Safran Electrical & Power, Safran Aircraft Engines and Safran Aerosystems, which stole the show by winning two awards.

### 3D-printed cases

Safran Transmission Systems continues to delve into the possibilities of additive manufacturing. In April the company delivered "3D-printed" cases for the power transmissions on Arrius 2R turboshaft engine to Safran Helicopter Engines, produced within Safran's ADD+ project. Advantages include 20% weight savings and fewer parts.



## SAFRAN AERO BOOSTERS

### Breathe, a new-generation booster

Safran Aero Boosters has developed a complete low-speed booster (low-pressure compressor) module featuring advanced aerodynamics to reduce weight by 68 kilos (150 lb). Tests are now underway in the United States.



### INNOVATHON 2019 SUPPORTS SMALL BUSINESSES

Safran organized its latest Innovathon in March 21, 2019, at the initiative of the Pacte PME, an association to foster the growth of small and medium-size enterprises. The aim? Share best practices during workshops and update the Open Innovation "white paper", submitted to the Pacte PME general meeting in June.

PresSense, the first "connected tire" for aircraft, developed jointly by Safran Landing Systems and Michelin, continues to roll down the development road. Tests of wireless tire pressure readings were successfully carried out on a Falcon 2000EX in January 2019.

# INTERIOR DESIGN... AIRBORNE STYLE

Safran Cabin has an ace in the hole in its quest to design harmonious and innovative aircraft interiors tailored to its customers' requirements: the ZEO design and innovation studio in Huntington Beach, California.



Developing a cabin mockup at the ZEO design studio in California.



## CREATING VALUE

-  
**Innovation at ZEO has four main thrusts to keep improving products in conjunction with customers.**

- > Reduce costs
- > Increase revenues
- > Improve the user experience
- > Embrace differentiation

As passengers board their airplane, they all want to quickly get seated and settle in for the flight ahead. On the way to their seats, they pass galleys and lavatories, then put their carry-ons in the overhead bin, sit down and take a deep breath.

That's where ZEO, Safran Cabin's own design studio, steps in. This innovation incubator is dedicated to the creation and prototyping of aircraft cabins, structures and equipment. It designs overhead bins, cockpit doors, lavatories, galleys and even complete cabin concepts. Its job is to make sure that the aircraft interior is practical and comfortable for everyone who uses it, from passengers and flight crews to the maintenance teams.

In the words of Scott Savian, Safran Cabin Executive Vice President, ZEO and Research & Technology, *"The aircraft cabin differs from most other aspects of an aircraft in that it is actively used by our customers, passengers or flight crews. As such, the cabin is not only evaluated on cost and weight related measures, but also on user experience, comfort and its ability to enable airline branding and differentiation."*

### A UNIQUE ENTITY

The air transport market is more competitive than ever, and airlines try to stand out by delivering a unique passenger experience, for instance through customized cabins. In addition to these marketing considerations, manufacturers have to integrate production requirements. They have to combine a modular design to adapt to different airline requirements with the ability to turn out these products in volume. The ultimate challenge is to reconcile all aspects: customer expectations, production requirements and the usual aviation imperatives of weight, safety and certification.

Safran Cabin is the only company in this sector with its own in-house entity to address these issues, namely ZEO. Organized in two complementary branches, one for design and one for research & technology (R&T), ZEO consolidates industrial design, advanced engineering, model-making and research coordination.

### AN INTERDISCIPLINARY APPROACH TO INNOVATION

Based in Huntington Beach, California, ZEO Studio spans 2,200 square meters (23,760 sq ft) dedicated to innovation, with 48 employees in charge of design. Industrial designers team up with engineers working on advanced concepts and product architecture to develop the most innovative, cost-effective solutions. They are backed by a workshop, outfitted with 3D printers and numerical control machine tools, capable of producing full-scale prototypes. This means that all projects can be immediately tested, modified and validated. Over and above the design aspects, ZEO also showcases new products and concepts for customers. This is the primary role of ECOS, a



› cabin demonstrator that supports the development and prototyping of proposed solutions.

ZEO Studio's staff work closely with their 46 counterparts at the R&T branch. As Scott Savian explains, *"Our R&T unit ensures our future success by developing key technologies which will enable us to create the products of tomorrow."*

In fact, R&T teams are embedded in different Safran Cabin companies, at three facilities in California, the Netherlands and Germany, ensuring that work by the Studio meets objectives in technology roadmaps.

The Studio can also count on Safran Cabin's marketing teams, who help identify new market opportunities.

## DESIGN, A STRATEGIC CHALLENGE

All of this work has a single overriding aim, namely to maximize value for all customers, from airlines to passengers. The company has set four primary objectives: reduce development, configuration, production, installation, flight and upgrade costs; maximize revenues by leveraging the full value creation potential of aircraft; enhance the user experience; and embrace differentiation.

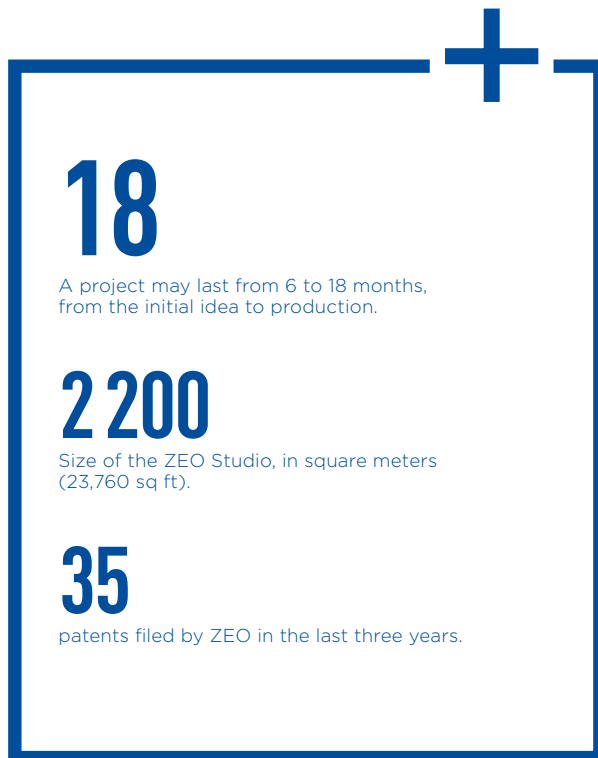
For instance, the creation of a new overhead bin is first studied to integrate the wide variety of carry-on bag shapes and weights, as well as any restrictions on closing the bins for cabin attendants. The data collected is analyzed to devise a solution that will maximize the use of cabin space, address passenger expectations and

facilitate the flight crew's work. *"ZEO has enabled our company to engage more deeply with customers, it has provided the dedicated resources to continuously create innovation solutions, and it enables us to go beyond our normal comfort zone,"* notes Nathan Kwok, Vice President Marketing.

## SETTING NEW STANDARDS

The Studio aims to set new industry standards and offer the associated products. In the words of Glen Noda, Vice President for Industrial Design, *"Within ZEO we have the rare opportunity to engage in projects that function at a strategic research level, defining new markets and testing product ideas."*

A number of patented innovations were first conceived by ZEO, including a quieter lavatory door using flexible hinges and a thinner overhead bin opening system to increase luggage space. These products are already being used by Delta Airlines and United Airlines. ■





### A NEW WAY OF TACKLING PROJECTS

In 2018, ZEO sponsored six engineering students from a neighboring school, California State University Long Beach, allowing them to work in a team that proposed innovative concepts to improve overhead bins.



### OPENING SOON...

In 2019, Safran Cabin's facility in Alkmaar, Netherlands, is kicking off the renovation of its design studio and test lab for galleys and food and beverage equipment. Once completed, this new center will allow customers, both flight crews and regular passengers, to participate in the development and testing phases. The grand opening is planned for 2020.



## SAFRAN ENGINEERING SERVICES

# Valentin SAFIR

**Chief Executive Officer,  
Safran Engineering Services**

The strategy applied by Safran Engineering Services has two main objectives: reposition its service offering in-house and expand its non-Safran business. The company's CEO explains what they are doing to support the Group's transformation, by providing engineering services and developing new job fields.



### **Half of Safran Engineering Services' business is for the Group. How are you repositioning your company to better support Safran?**

V.S.: First, in terms of general engineering, we have refocused on our core business sectors, where we offer recognized expertise and critical mass. We have chosen to focus on mechanical and electrical design, production engineering support, software development, etc. Secondly, while continuing to provide these conventional services, we are also helping Safran change its procurement approach in these areas. We have to embody a future-looking business model, in terms of providing integrated services instead of simply technical assistance, and taking charge of complete work packages, deploying more automation and bringing in our teams from India, Mexico and Morocco. Our end-goal is simple: take a proactive stance to offer solutions that allow Safran companies to lower their costs. We have already reviewed certain contracts, for which we have made commitments in terms of results and fixed prices.

### **You also decided to invest in emerging job fields and sectors, right?**

Y.S.: Absolutely! We identified the new skills needed by Safran now and in the coming years, and we are enhancing our employees' skills in system engineering, aircraft modifications with our

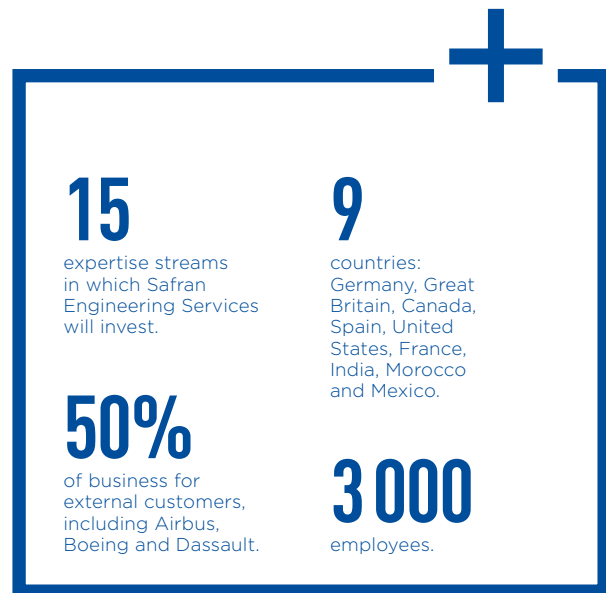


Design Organization Approval (DOA) team, digital continuity and technologies underpinning the Factory of the Future, including additive manufacturing, virtual reality and data analysis. It is not our intention to replace the R&T activities of entities like Safran Tech or Safran Analytics, but rather to supply the operational skills needed by companies to successfully complete their projects.

We also support our companies in key areas and functions, such as management and continuous improvement. Our Project Management Officers (PMO) work with companies to ensure better control over development costs. In addition, we specialize in supplier performance monitoring. There is a real need to encourage these job fields within Safran.

At the same time, we help Group companies deploy new tools and processes, especially within the scope of the One Safran initiative. And we are

**“We are now enhancing our employees’ skills in system engineering, aircraft modifications, digital continuity and technologies underpinning the Factory of the Future, including additive manufacturing, virtual reality and data analysis.”**



of course working with new entities, including the former Zodiac Aerospace companies.

The upshot is that we will be able to create real expertise streams for these job fields, along with the associated training courses, which requires investments in terms of recruitment, know-how, technologies and tools. Subsequently, we plan to offer a real skills pool that can meet external recruiting and internal transfer requirements.

#### **How are you tracking this repositioning project?**

V.S.: We carry out regular monitoring with our steering committee, composed of Alain Sauret, CEO of Safran Electrical & Power, Jean-Jacques Orsini, Safran Executive Vice President for Performance and Competitiveness, Stéphane Cueille, Safran Senior Executive Vice President for R&T and Innovation, and Thierry Haud, Vice President, Purchasing. We track indicators such as outsourcing trends and the development of niche activities, both fundamental to the Group’s integration. Our new contract terms and

conditions have already generated very encouraging savings — up to 20% in certain cases. In short, we have to sustain our momentum and keep an eye on Safran’s evolving requirements: it’s a structural project for the long haul! ■

# MODULAR SEATS TO REVAMP PRODUCT LINES

Safran Seats' Research & Technology department initiated a major project in 2019 to enhance product modularity. The aim is to reduce costs on different product lines by pooling developments, while also allowing customers to further personalize their seats.

The airplane seat market is being shaped today by two powerful trends: demand for reduced development cycles and costs; and demand for increasingly customized products. Safran Seats has been recognized by customers for many years for its highly personalized seat offering, but it still had to change its production methods to remain competitive and restore customer confidence.

## MODULAR ENGINEERING

"To address our changing markets we're applying an innovative 'modular platform' approach to product development," explains Quentin Munier, Executive Vice President, Strategy and Innovation at Safran Seats.

*"The seats we delivered had few parts in common, which generated high development costs. Today's modular approach aims to simplify design while still maintaining a high degree of personalization."* For example, using this modular approach, the modules developed for Versa could also be used on our Optima® product line, which optimizes our engineering efforts and decreases costs.

## MAJOR BENEFITS

When developing a seat product line, the company's engineers take a holistic approach, encompassing the entire lifecycle. From design and production to subsequent upgrades and support services, our teams are always seeking to reduce lead times, parts counts and costs. The company will apply this approach to simplify all operations. In the words of Quentin Munier, "We will accelerate our response to market demand, boosting Safran Seats' competitiveness and restoring our leadership." ■



## VERSA, A MODULAR PLATFORM

### SEAT STRUCTURE AND MECHANISM

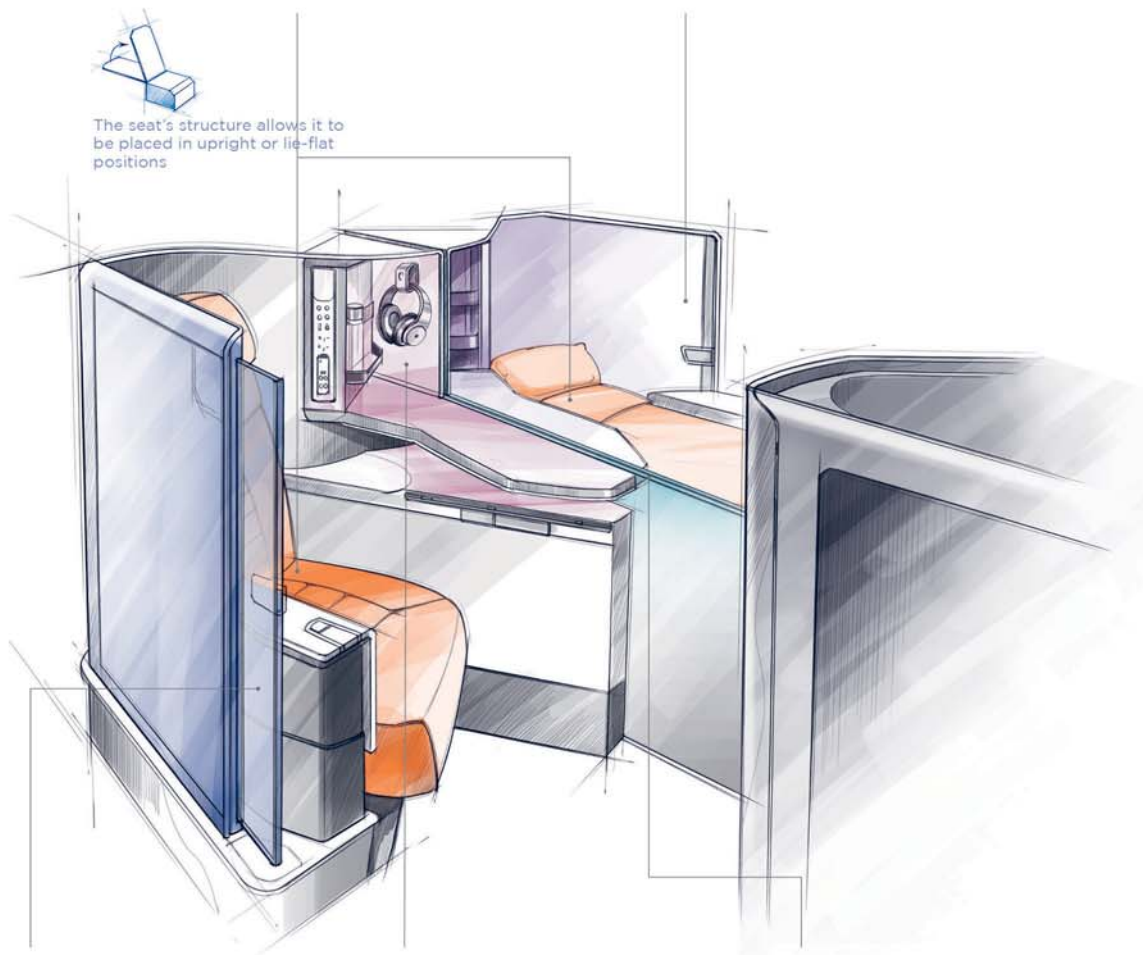
The mechanism and structure of the Versa business seat are inspired by those of the Optima. Versa will become the sole basic structure for all future product lines.



The seat's structure allows it to be placed in upright or lie-flat positions

### SHELL

All versions of the seat share certain shell components: console, storage space and passenger modules. The shell itself flies the airline's colors.



### DOOR MODULES

Versa's door (soft or rigid) will also be available on the Cirrus model as a retrofit option.



Sliding side door

### PASSENGER MODULE

This highly visible module can be customized for different airlines, although the mechanical components are standardized.

### CENTRAL PARTITION

All types of aircraft use the same mechanism for the central partition.



Adjustable partition



# One Safran



## STRONGER TOGETHER

 SAFRAN