Safran India
July 8, 2022
Press Kit
01 - Safran in India
A strategic partnership between Safran and India

- Safran has been a strategic partner to India for more than 65 years

- **5 core activities**
  - Engines and equipment for civil aircraft, space propulsion, helicopter engines, military engines for Mirage 2000 and Rafale, equipment for armed forces

- **Development of a local aerospace ecosystem**
  - Safran is building up an Indian supply chain for LEAP engines as part of the **Make in India** program.
  - Safran has already secured offsets from the Indian supply-chain and is planning to further expand it while increasing the complexity of the parts produced in India.
  - Current major suppliers are JV SHAE, Godrej & Boyce, Maini, Recaero India, Mach Aero India, SQUAD (JV with AEQUS and A&D).

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Over the years, Safran has seen strong organic growth in India. Investments made by the Group have significantly supported local growth and are now accelerating.
Safran’s footprint in India

- **Production**
  - Safran Aircraft Engines
  - Safran Electrical & Power
  - SHAE (50/50 JV between Safran Aircraft Engines and HAL)
  - Safran Electronics & Defense
  - Safran Helicopter Engines

- **MRO**
  - Helicopter Engines MRO (50/50 JV between Safran Helicopter Engines and HAL)

- **Training**
  - CFM Training center (CFM International is a 50/50 JV between Safran and GE)

- **Services**
  - Digit: IT services (starting in summer 2022)
  - Safran Engineering Services

Safran’s footprint and leadership in India highlight its commitment to the “Make in India” policy, and foster the development of partnerships with a wide range of customers and suppliers.
Safran in India

65 years of presence

750 employees

10 sites

CFM Training Center
Safran Electrical & Power
Safran Aircraft Engines

Digit
Safran Aircraft Engines Services
(operations to begin in 2025)

Hyderabad

Digit
Mumbai

HE-MRO**
Goa

* Joint venture between Safran Aircraft Engines and HAL
** Joint venture between Safran Helicopter Engines and HAL

Safran India
Safran Electronics & Defense
New Delhi

Safran Helicopter Engines
Safran HAL Aircraft Engines*

Safran Engineering Services
Bangalore
Indian subcontinent commercial aviation market

Traffic perspectives
all aircraft

A large and fast-growing market

- Air traffic in the Indian subcontinent forecasted to more than double by 2041.
- Fleet to almost double, from 842 aircraft today to 1,600 in 2041.
- 1,200+ new aircraft deliveries within 20 years, 77% being narrowbody jets.
- India represents over 80% of these figures.

India to become 3rd worldwide domestic market.
Safran and the Indian civil aviation market

- 330+ aircraft powered by CFM* engines operated by 14 airlines in the region
  - 300+ aircraft in India: 150+ aircraft with CFM56** and 150+ with LEAP***, operated by 7 Indian airlines
    - AirAsiaIndia, Air India, SpiceJet, Vistara, Indigo, Go First, Akasa Air
  - Other airlines in the region: Biman (Bangladesh), US Bangla (Bangladesh), Bhutan Airlines, Drukair (Bhutan), Himalayan Airlines (Nepal), Maldivian Airlines (Maldives), Sri Lankan Airlines (Sri Lanka)

- 1,500+ LEAP engines in backlog for Indian subcontinent

- 400+ aircraft equipped with Safran wheels and carbon brakes
  - One of the leading suppliers of wheels and carbon brakes (72% market share) for the Airbus A320, Boeing 737, 777-200LR/-300ER and 787 Dreamliner aircraft operated in India.

* CFM International is a 50/50 JV between Safran and GE  / ** CFM56 engines power A320 and Boeing 737 / *** LEAP engines power A320neo and Boeing 737 MAX
**Defense: Safran is a strategic partner of Indian Air Force**

- **Historical partnership with Indian Air Force**
  - 58 M53 military engines for their 48 Mirage 2000

- **Major contributor to the 36 Rafale acquired by India in 2016**
  - Safran on board:
    - M88 engine
    - power transmission system
    - landing gears
    - wheels and carbon brakes
    - ring laser gyro inertial navigation syst.
    - gyroscopes for the fly-by-wire system
    - auxiliary power unit (APU)
    - all the wiring systems
  
  - Safran selected to supply the Hammer modular air-to-ground weapon

First Rafale delivered in October 2019, latest ones being delivered in 2022. Indian RFI issued for an additional 114 Rafale for IAF and 57 Rafale naval versions for Indian Navy.
Defense: Safran is a strategic partner of Indian Air Force

- Over 600 fighter aircraft used by the Indian Air Force and Navy are equipped with inertial navigation systems produced by Safran

- India’s Armed Forces are one of the largest operators of Safran-designed helicopter engines
  - 1000+ engines, including 250 TM333 and over 500 Shakti (also known as Ardiden 1H1).
  - Shakti has been selected to power the Light Combat Helicopter (LCH)
  - The Ardiden 1U variant powers the new Light Utility Helicopter (LUH)
02 – New Safran sites in Hyderabad
Two new sites in Hyderabad

- **Safran Aircraft Engines is co-localized with Safran Electrical & Power** within a Hyderabad Safran hub sharing support functions such as HR, Finance and IT, and common services including transportation, catering and security.
  - **Investment**: approx. 50 million USD for the two sites

- **Why Hyderabad?**
  - Growing city (population 10+ million)
  - Development of aeronautical skills in Telangana state
  - 10+ years experience with CFM Training Center
  - Safran hub in the airport area: services and logistics
Safran Aircraft Engines Hyderabad

- **Indian production factory for LEAP rotating seals**
  - Decision in 2018 / building ready end 2021
  - First deliveries in May 2022
  - 15,000 sqm plant
  - On-site photovoltaic electricity production facilities: production of 1/3 energy consumed in 2025

Full capacity scheduled in 2025 with 275 employees and 10,000 parts delivery.
Safran Aircraft Engines Hyderabad

- 40 turning and milling machining centers
- Wide range of special processes including plasma coating needed non-destructive testing and measuring machines to check part conformity.
Safran Electrical & Power

- Indian production facility for electrical harnesses
  - Announcement in March 2018 / first delivery in Nov 2018
  - 4,500 sqm facility
  - 150 employees
  - 8,000 harnesses delivered since 2018
  - New program in 2024: Falcon 10X

200 employees anticipated in 2024-25.
**Safran Electrical & Power**

**Wiring for LEAP engines**: production +20% in 2023 vs 2022

**for Rafale**: production x10 between 2022 and 2024

**for LEAP FADEC**: production x2 in 2023 vs 2022
Future Safran India Digital Campus

- Hyderabad & Mumbai new Safran centers in 2022
- Digitalization is a top Group priority, which needs a strong IS transformation
  - To support its IT & digital developments, Safran decided to internalize expertise and skills as a key lever to master and succeed its digital transformation at competitive cost
  - Creation of a large development capability in India with two new centers starting in June 2022:
    - The Hyderabad center will be dedicated to the digital systems & applications development. The Mumbai center for cybersecurity and infrastructure support
    - Skilled, dynamic and innovative people. Huge pool of skills in India with 5 million IT resources in the country

1,000 internal resources will be recruited over 5 years (800 in Hyderabad, 200 in Mumbai).

Aju Varghese
Digit Managing Director
Future Safran Aircraft Engines MRO shop in 2025

- **Indian fleet to more than double within 20 years**
  - India MRO shop will be the largest in the Safran Aircraft Engines MRO network
  - New 4.0 MRO shop to support the growth of LEAP aftermarket activities in the coming years
  - Full overhaul of LEAP to support Indian subcontinent customer base
  - Strong logistic network in proximity: transportation, industrial ecosystem, customer access
  - State-of-the-art Safran skills and industrial standards
  - First customer engine overhaul to start in 2025, ~2 years after starting construction
  - Investment: approx. 150 million USD

Up to 1,000 engineers & highly skilled technicians after ramp-up. Overhaul capacity of 250/300 engines per year.
03 – New Safran site in Bangalore
SHAE – Safran HAL Aircraft Engines

- **SHAE**, a 50/50 joint venture between Safran Aircraft Engines and Indian group HAL
  - First 4,800 sqm factory inaugurated in 2005, to manufacture simple and complex pipes for air, oil and fuel circuits of aircraft and helicopters engines.
  - Production transfer: new facility completed in early 2022 to meet the challenges of the LEAP ramp-up.
  - 11,200 sqm
  - 145 direct employees
  - Investment of 4.6 million USD for the site transfer
  - 250 references of simple and complex parts

**Production: 10,000 parts per month in 2023.**
SHAE – Safran HAL Aircraft Engines

- **Aircraft engines**
  - LEAP (100+ rigid pipes)
  - CFM56
  - GE90-115K

- **Helicopter engine**
  - Ariel

- **Processes**
  - Bending, welding, brazing, non-destructive test

New complex parts in development.
04 – Other Safran companies in India
CFM* Training Center in Hyderabad

- **Dedicated to CFM56**, the training center was inaugurated in 2010 (15 million USD investment)
- Advanced hands-on courses in line maintenance and borescope inspection for CFM56-7B and CFM56-5B engines
- **Capabilities for LEAP-1A and LEAP-1B** since 2018

Skills development in India: 500 engineers trained annually.

*CFM International is a 50/50 JV between Safran and GE*
Safran Electronics & Defense

- **Key provider** of inertial navigation systems, optronics, avionics, electronics and critical software for applications serving both civil & military markets.
  - 1,300+ Inertial navigation systems (Sigma family)
  - 460+ Optronics solutions for aircraft, ships, submarines, battle tanks, arty guns
  - 270+ FADEC
  - 250+ Automatic flight control systems and actuators for helicopters
  - 200+ Hammer air-to-ground weapons ordered for fighter jets

- **Support services** for the large installed base of inertial navigation system and optronics solutions in service in the Indian Armed Forces.
  - 40+ support benches for optronics and inertial navigation system spread in the country
  - 6 repair facilities for self-sufficiency of Forces
Safran Electronics & Defense

- **Transfer of production & technology**: 30+ years of experience in India
- Transfers with its Indian partners HAL and BEL (Bharat Electronics Limited) as well as joint developments done with Indian DRDO labs (Defense Research and Development Organization).
  - Transfer of production with HAL for gyromechanical navigation systems, actuators for helicopters & SIGMA-95, and inertial navigation system for fighters
  - Transfer of technology with BEL of navigation complex system for submarines
  - Joint developments with DRDO/HAL/BEL of inertial navigation systems
Safran Engineering Services in Bangalore

- Created in 2002
- **Engineering services to the aerospace** and ground transport industries.
- Niche skills for artificial intelligence, machine learning, augmented reality, virtual reality, data analytics, IoT, automation, health monitoring and additive manufacturing.
- Avionics and IoT lab facilities in-house for research and development and testing.
- **425+** engineers working on all the major aeronautical programs (Boeing, Airbus, Gulfstream, Dassault Falcon) and safety critical systems.
Safran Helicopter Engines in Bangalore

- Safran Helicopter Engines is the **single source for all HAL’s helicopter engines.**
- Safran Helicopter Engines India is dedicated to **supporting its Indian partner HAL** (Hindustan Aeronautics Limited) as well as the Indian Armed Forces and Coast Guard.
- With a fleet of over **1,000 engines**, including 250 TM333 and over 500 Shakti, India’s Armed Forces are one of the largest operators of Safran-designed helicopter engines.

**Shakti**:
- Indian variant of the Safran Ardiden 1H1, co-developed with HAL
- 500+ Shakti engines produced
- Shakti installed on HAL’s Dhruv and Rudra and has also been selected to power the HAL-designed Light Combat Helicopter (LCH)
- The Ardiden 1U variant powers the new Light Utility Helicopter (LUH), a three-ton single-engine aircraft. The engine was certified by DGCA (India) on July 26, 2021
Safran Helicopter Engines in Goa

- Safran Helicopter Engines and Hindustan Aeronautics Limited (HAL) broke ground on March 2022 on their Joint Venture facility, Helicopter Engines MRO Pvt Limited (HE-MRO), at Sattari, in Goa.

- Commitment to the Indian Government’s vision « Atmanirbhar Bharat » towards achieving self-reliance in defense technologies and MRO (Maintenance, Repair and Overhaul).

- The 1,000 sqm training and office facility and a 3,800 sqm international class shop facility will provide MRO services for Safran TM333 and HAL Shakti engines.

- 60+ qualified engineers and technicians.

- Expansion capacity for other engines in the future.

HE-MRO operational by the end of 2023, with a capacity to repair 50 engines a year and a full-capacity goal of 150 engines in the coming years.
5 - Biographies

In 1990, Olivier Andriès joined the Treasury department at the French Ministry of Finance where he oversaw aerospace and defense companies. In 1993, he joined the cabinet of the Minister of the Economy and Finance, as advisor on industrial affairs.

In 1995, he moved to the Lagardère group as Deputy Director of Strategy, and was named personal advisor to Jean-Luc Lagardère in 1998.

In 2000, Olivier Andriès joined Airbus, in charge of Widebody Aircraft Programs. He was appointed to the Executive Committee in 2005 as Executive Vice President, Strategy.

In 2008, he joined Safran as Executive Vice President, Strategy and Development. He was subsequently named Executive Vice President, in charge of the Defense and Security branch, and a member of the Management Board, in 2009.

In 2011, Olivier Andriès was named Chief Executive Officer of Safran Helicopter Engines.

In 2015, he was appointed Chief Executive Officer of Safran Aircraft Engines.

On January 1st, 2021, Olivier Andriès became Chief Executive Officer of Safran.
Alexandre Ziegler, 52, holds a graduate degree in history from the ENS Lettres et sciences humaines (1992), as well as degrees from Sciences-Po Paris (1993) and the Ecole Nationale d’Administration (1995-1997).

Alexandre Ziegler started his career in 1997 as advisor to the strategic, security and disarmament affairs division of the French Ministry of Foreign Affairs. He held a series of positions between 2000 and 2010, including Deputy Counsel General in Hong Kong, First Secretary, then Second Counselor in Berlin, and Counselor for Culture and Cooperation in Beijing.

Alexandre Ziegler was then appointed head of programs and network at the Globalization, Development and Partnerships division in the Ministry of Foreign Affairs. He held this position until 2012, when he joined the cabinet of the Minister of Foreign and European Affairs. He was named chief of staff at the Ministry of Foreign Affairs in June 2013.

From 2016 until joining Safran in September 2019, he was the French Ambassador to India.
Pierre Dickeli, 61, is graduated from ENSIEG (Ecole Nationale Supérieure d'ingénieurs Electriciens de Grenoble).

Pierre Dickeli started his career in 1986 at Crouzet, then Sextant Avionique (Thales Group), as an international sales manager (USA - India - Russia, ...). In 1996, he joined Alstom Transport Division, of which he became head of business development for the Maghreb area, after having had commercial responsibilities in the USA and Asia.

In 2004, Pierre Dickeli moved to Snecma Military Engines Division; in 2011, he became Sales Director, and Division Representative within the GIE Rafale, during the Rafale orders in Egypt, Qatar and India.

In June 2019, Pierre Dickeli is appointed CEO of Safran India
Jean-Paul Alary – Chief Executive Officer of Safran Aircraft Engines

Jean-Paul Alary, 56, is graduated from the Ecole Centrale Paris engineering school (1990).

Jean-Paul Alary started his career in 1991 at Snecma Moteurs (now Safran Aircraft Engines). After heading a business unit at Microturbo Limited (now Safran Power Units), he joined Hurel-Hispano (now Safran Nacelles) in 2004 as program manager, was named head of Aircelle's Large Nacelles division in 2007, then Vice President, Programs in 2008.

He moved to Snecma's Commercial Engine division in 2010 as head of customer support. In 2013, Jean-Paul Alary was named Executive Vice President, Safran Electronics division at Sagem (now Safran Electronics & Defense).

In 2015, he was named CEO of Safran Nacelles, and in 2018 he was appointed CEO of Safran Landing Systems.

In 2019, he was named CEO of Safran Aircraft Engines.
Serge Pons, 56, is graduated from the ENSAM Engineering school (1988).

Serge Pons has spent his entire career in the Group. He joined Hispano-Suiza (now Safran Transmission Systems) in 1990 where he became successively Methods Manager, Programs Manager and Production Manager until 1999. Then he has been appointed Operation Manager at Labinal (now Safran Electrical & Power) before moving to Snecma Services (now Safran Aircraft Engines) in 2002 as Purchasing improvement Manager, and Vice-President Purchasing in 2003.

He joined Messier-Bugatti in 2006 as Director of Industrial development for the Wheels and Brakes division, and was appointed Vice-President Purchasing in 2008. In 2011, he became Executive Vice-President of the Systems Equipment Division of Messier-Bugatti-Dowty (now Safran Landing Systems).

In 2019, he joined Safran Electrical & Power to become President of Safran Ventilation Systems, and since 2021, he is Executive Vice-President & General Manager of Interconnection Systems Eurasia.
06 – Overview of Safran
a world leader in aerospace
An industrial high technology group

76,800 employees

€15.3 billion in revenues in 2021

125 years of history: the oldest aero-engine manufacturer in the world

No.3 aerospace company worldwide (excluding aircraft manufacturers)
A worldwide presence

At year end 2021

76,800 employees in 27 countries

Facilities

- R&D and production
- Support and services
- Offices

<table>
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<th>Region</th>
<th>Employees</th>
<th>R&amp;D and production</th>
<th>Support and services</th>
<th>Offices</th>
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Africa / Middle East
5,084 employees

- R&D and production
- Support and services
- Offices

Safran in India – Press Kit July 2022
A world leader in our core markets

**No.1 worldwide**
- Narrowbody commercial jet engines (in partnership with GE)
- Helicopter turbine engines

**No.1 worldwide**
- Interiors for regional and business aircraft
- Aircraft water and waste management systems

**No.1 worldwide**
- Landing gear
- Wheels and carbon brakes (mainline commercial jets with more than 100 seats)
- Aircraft wiring
- Evacuation slides
- Oxygen systems

**No.1 in Europe**
- Tactical drones
- Inertial navigation systems
- Optronic (electro-optical) systems

**No.1 worldwide**
- Space surveillance via RF sensors
- Modems for satellite station keeping and space probe control
- High-performance space optics
Aircraft propulsion: proven innovation and reliability to support aircraft manufacturers and airlines
Flagship engine: LEAP

New-generation turbofan designed by CFM International*

3 versions powering the Airbus A320neo, Boeing 737 MAX and COMAC C919

Order backlog: +9,700 engines at end 2021 (firm orders)

15% lower fuel consumption and CO₂ emissions than the CFM56®

50% margin in NOₓ emissions versus the CAEP/6 standard

Complies with future noise standard, Chapter 14

* A 50/50 joint company between Safran Aircraft Engines and GE
Aircraft equipment: a complete range of products and services
Aircraft interiors: an extended range for all types of aircraft to enhance passenger comfort

Cabin

Seats

Passenger comfort
Defense: protecting citizens through technology

Navigation and guidance

Optronics

Drones and robotics

Dismounted warfighters

Guidance solutions
Flagship product: HAMMER

High-precision guided modular air-to-ground weapon family

Powered smart munition with an extended standoff range

Effective anytime, anywhere

Modular guidance kits and warheads: the right targeting system suited to all strike missions

Unique hit accuracy and maneuverability

In service and combat-proven
Space: state-of-the-art technologies to drive progress

Launch vehicles*

Satellites

Ground stations

Space optics

* through ArianeGroup, a 50/50 joint company between Safran and Airbus, and its Arianespace subsidiary
Safran’s mission:
making aviation more sustainable
and the world a safer place
Decarbonizing aviation, our strategic priority

Innovative technologies to contribute to a “zero emission” aviation by 2050

- Disruptive engines, lightweight equipment
- Sustainable aviation fuels
- Hybrid and all-electric aircraft propulsion
Reducing the environmental impact of our operations

A low carbon plan applied at all facilities
-30% in greenhouse gas emissions (for scopes 1 and 2) by 2025, -50% by 2030*
Driving innovation for sustainable growth

Invent, build and deliver tangible high-tech solutions to shape tomorrow’s aviation sector

75% of Safran’s R&T investment goes to reduce the environmental impact of air transport

1,176 patent applications filed in 2021 worldwide (Safran, No. 1 in France for patents filed – 1,037 applications)

€1.43 billion invested in R&D in 2021

12,000+ employees involved in R&D
An ambitious CSR strategy

Decarbonize aviation

Be an exemplary employer

Embody industrial responsibility

Affirm our corporate citizenship