**Power Transmissions**

Today

Power transmission systems tap mechanical energy from engines to drive accessories such as fuel pumps, lubrication systems and starters, along with generators. Safran is the world leader in the market for mainline commercial jets (over 100 seats), with transmissions for all types of aircraft.

**Innovation Challenge**

From materials and processes to system design, Safran is already working on concepts and technologies capable of delivering significant improvements in performance for tomorrow’s aircraft – like the Open Rotor and Ultra High Bypass Ratio (UHBR) engines, or hybrid electric distributed propulsion systems for certain applications.

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**Electric Generators**

Today

These generators convert a small fraction of the mechanical energy from the main engines or APU into electricity to power all electrical systems on the airplane. Safran offers electric generators for all types of civil and military aircraft, including mainline, regional and business jets, as well as helicopters.

**Innovation Challenge**

Safran offers different families of compact yet powerful electric motors with integrated control electronics, tailored for various applications such as landing gear actuation. Other motors are purpose-designed to drive propellers on aircraft with all-electric or hybrid propulsion systems.

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**Electric Motors**

Today

Some actuation functions on today’s aircraft are handled by electric motors, which could even totally or partially replace conventional hydraulics and pneumatics on flight controls, brakes, thrust reversers, etc.

**Innovation Challenge**

Safran is developing the most extensive and advanced range of “smart” generators on the market, with fully integrated control electronics.

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**Power Management**

Today

These units control the electrical equipment on aircraft, including generators, motors and much more.

**Innovation Challenge**

Power management is taking on an increasingly important role with the electrification of aircraft, to distribute this energy and ensure a stable and protected power supply.

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**Wiring**

Today

World leader in aircraft wiring, Safran designs electrical wiring interconnect systems, comprising harnesses, cabinets, racks, etc. for all types of aircraft and systems, including operations in harsh environments.

**Innovation Challenge**

Because of the high power required by non-propulsive electrical functions and emerging propulsion needs especially propulsion, the aim is to develop smart distribution systems, capable of managing an increasing number of loads, and supporting high voltages without overheating, short circuits or arcing.

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**Electrical Distribution**

Today

Safran supplies systems that generate electricity for non-propulsive functions, known as auxiliary power units (APU).

**Innovation Challenge**

Emerging more and more electric architectures are changing the traditional role of the APU, making it less and less “auxiliary”. Safran is therefore developing the eAPU to address the requirements of new more electric aircraft, and is already looking further ahead with fuel cells that could supplement or even replace APUs.

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**Auxiliary Power Units**

Today

All aircraft are fitted with batteries used to start their engines. Safran is involved here as well, since we integrate the battery in the aircraft’s electrical system. At the same time, we are developing our own battery pack technology by combining the best available chemicals and cell structures with advanced thermal, mechanical and electrical management devices.

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**Innovation Challenge**

Tomorrow’s batteries will have to rise to the challenge of electric propulsion. Safran is naturally focused on significantly increasing battery power density and endurance, while keeping weight as low as possible.

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1 CFM International is a 50-50 joint company between Safran Aircraft Engines and GE.

2 Here, an electric motor actuates the thrust reverser and is connected to a power management unit.