What is SPEC, and what does it aim to achieve?
For the last decade or so, aircraft have been gravitating towards more electric systems. Safran was quick to get onboard this trend, which we think is key to rising to the economic and environmental challenges facing air transport, and to this end we created the Safran Power Electronics Center (SPEC) in 2005 as a network-based skills cluster. It is overseen by Régis Meuret, the Group's resident power electronics expert, and aims to bring together and organize early-stage research activities in Group companies involved in electrifying aircraft systems. But at the same time, it also seeks to network them with high-level French and international academic partners and innovative SMEs.

Almost forty doctoral students in electrical engineering have already signed up to work with our research teams. We've also forged strategic partnerships with outside research centers. The latest to date is the IPES lab dedicated to power integration in harsh environments, which Safran formed in 2013 with the Ampère lab consortium*.

What are your main areas of research?
First we are looking into power electronics and electrotechnics used in harsh environments, where a variety of constraints need to be factored in such as electromagnetic compatibility (EMC), lightning and high temperatures. EMC is important because the more an aircraft's systems are electric, the higher the risk they'll generate electromagnetic interference that could negatively affect their own performance as well as nearby devices'. Lightning, meanwhile, can seriously damage the aircraft's electrical circuits. The issue has only gotten more complicated in later generations of planes where the fuselage contains more and more composite materials, which offsets the protective effects a metallic structure would normally provide. That's why the equipment needs to be better protected via specific anti-interference systems.

And lastly, we're focusing a huge amount of research on materials that can withstand temperatures in excess of 200°C. With these, we'll be able to reduce our use of cooling systems, and install electronics and electric machines in extremely hot environments like the engine or the brakes for example.

What other areas are you researching?
We're doing a lot of work into changing distribution networks and optimizing the size of electric systems. Currently commercial aircraft use AC-based electric distribution, but that's gradually changing in favor of DC. This opens the door to bidirectional power supply where different pieces of equipment can exchange power. All of this 'upstream' research is essential for the Group, because our strategy is to master the entire electrical chain on board planes. And to help make these ambitions a reality, Safran announced at the start of the year that it had created a new company, Labinal Power Systems, and acquired the embedded power distribution and integrated cockpit solutions businesses from Eaton Aerospace.

* CNRS/INSA Lyon/Centrale Lyon/Claude Bernard University – Lyon 1