

EQUIPMENT

# MAKING DREAMLINERS COME TRUE

Safran supplies the Boeing 787 Dreamliner's landing gear. We traveled to the Boeing plant in Everett, near Seattle, to talk with three of Safran's key actors in this partnership.

**S**ix o'clock in the morning ... or even earlier! The work day often starts well before sunrise at Boeing's huge plants in Everett and Renton, near Seattle, Washington. Safran's staff is of course on Boeing time as well, including French expats Nicolas Cathelin and Thomas Durolet, and American Nick Nelson. They are obviously on the same schedule as everybody at Boeing. At stake is a major program that the giant plane-maker will be overseeing for decades to come, the new-generation 787 Dreamliner commercial jet.

"Safran provides the main landing gear for the 787," notes Nick Nelson from Messier-Dowty, who is in charge of landing gear assembly. "The Messier-Bugatti (Safran group) wheels are fitted with tires by Boeing, who sends this assembly to us. We take direct delivery of the electric brakes, designed by Messier-Bugatti, and landing gear wiring from Labinal, also a Safran company. We then assemble all these components on the gear legs that are shipped from the Messier-Dowty Toronto plant, and we deliver the integrated landing gear to a Boeing assembly line just a couple blocks away." By "we", Nick Nelson means his team, comprising two technicians, an inspector and a quality engineer. This five-man team delivers two landing gear sets per month to Boeing. Since production of the 787 involves rolling the plane from one assembly station to another, the on-time delivery of landing gear is vital to keep the line moving.

"We are totally obsessed with delivering the hardware on time and in perfect condition," emphasizes Nick. "Sometimes we have to be flexible to cope with the emergencies that seem to crop up all the time. For instance, we've even had to take delivery of parts on a Sunday morning, so we could deliver the complete landing gear on Tuesday."

## Mutual trust

Boeing traditionally produced all systems for its aircraft in-house, including the landing gear. With the 787, however, the plane-maker contin-



Labinal supplies the wiring for the Dreamliner's landing gear.



Installing the carbon brakes.

## The Boeing 787 under test

Six 787 Dreamliners will be used for flight testing, three equipped with wheels and electric brakes by Messier, and two outfitted by Goodrich. The first aircraft had a mixed configuration: Messier-Bugatti on the right, Goodrich on the left! Twelve production-standard aircraft have already been built or are being assembled.



Attaching the wheel to the brake assembly.



Installing the strut.

ues its transformation by increasingly transferring responsibility for major subassemblies to Tier 1 suppliers. "This marks a deep change in the corporate culture," notes Nicolas Cathelin, the Messier-Bugatti representative in Everett. "We have to be absolutely flawless in our relations with the airframer, and that depends on establishing relations of mutual trust with everybody involved in the program, from the fitters and quality inspectors on the line, to the flight test teams." Nicolas Cathelin is responsible for technical support of all Safran wheels and brakes. "My job also involves marketing to a certain extent, on behalf of Messier-Bugatti, as well as logistics aspects, such as facilitating the customs procedures for various parts shipped from France." He operates out of a building just a stone's throw from Boeing's plants, alongside other Safran entities, including Technofan, Safran Electronics and, since early March, the Messier-Dowty team headed by Nick Nelson.

Thomas Durolet, the on-site Messier-Bugatti program manager for Boeing Commercial programs, also has his office in this building, as he explains: "My presence here can be traced back to when Boeing set up an actual joint program platform during the development of the 787. Today, I work on all aircraft under development, starting with the Dreamliner. The 787 is now being flight tested, and there are still adjustments to be made on the systems we supply, with the help of Safran Power, in charge of the braking control systems. I'm also heavily involved in two other programs, namely carbon brakes for the Boeing 737, and the tire pressure and brake temperature monitoring system for the Boeing 747-8."



A complete landing gear being trucked to the Boeing final assembly plant.

Even though the Everett plant is just a few blocks away, most contacts are by phone or videoconference. "Many decisions are made in meetings at Boeing, and barely a day goes by when I don't take part in a meeting on the 787," adds Thomas Durolet. Program reviews are organized weekly, and teams meet on a quarterly basis at Everett or Vélizy (near Paris, Messier headquarters in France). ■