TP400: an exceptional engine for the exceptional A400M

The first Airbus Military A400M airlifter has been delivered to the French Army, a delivery celebrated by a ceremony which took place on September 30th in Seville and Orleans. Snecma (Safran) was the driving force behind the versatile design’s four turboprop engines. Pierre-Yves Bourquin, Program Director at Snecma, takes a moment to tell us more about it.

We know Snecma is one of four engine manufacturers that make up EuroProp International* (EPI), the European consortium that designed the A400M’s TP400 engine. What we don’t know is exactly what Snecma contributed.

Snecma is EPI’s main partner and controls 32% of the program. Technically speaking, we’re in charge of the combustion chamber and the high-pressure turbine, or what we call the ‘hot’ parts of the engine. Since these are the most sensitive and complicated areas, they require the most technical prowess. We also integrate critical elements like the engine control system, which includes the fuel system and the FADEC**, and the accessory gearbox or AGB, which is supplied by Safran’s own Hispano-Suiza and transmits power throughout the aircraft, as well as other equipment. Technical abilities aside, our extensive experience in engine manufacturing also came in very handy, and got the program through more than one sticking point. Safran helped out too by letting EPI use its engine test stands in Istres, France and Liers, Belgium, at its Techspace Aero subsidiary.

What sets the TP400 apart from other engines?
The TP400 is the most powerful turboprop – i.e. propeller – engine ever built in the West, with a whopping 11,000 shp! On top of that, it boasts a high bypass ratio***, which ensures the engine’s energy efficiency and, by extension, lowers its fuel consumption. In aircraft like the A400M, that translates into a longer range or a heavier payload. Another unique feature is that the FADEC system controls both the engine and the propeller to optimize performance. Not to mention it’s the first turboprop ever to be certified for both civil and military use. That means it meets the higher world civil standards for flight safety and may even be used down the track outside the military realm.

Can Snecma capitalize on its EPI experience in other projects?
Our teams found the 10-year partnership with the other European engine manufacturers really rewarding. For instance, it helped us improve relations with Rolls-Royce and MTU Aero Engines. The Germany MTU even set up a joint venture with Sagem (Safran) specializing in critical software and hardware for military and civil applications. In fact, they’re the ones who developed the TP400’s control system! *EuroProp International is a consortium of engine manufacturers formed by Industria de Turbo Propulsores (ITP – Spain), MTU Aero Engines (Germany), Rolls-Royce (United Kingdom) and Snecma (France).

** FADEC (Full Authority Digital Electronic Control): an electronic control unit that regulates engine performance.

*** Bypass ratio: the ratio of the mass flow rate of air drawn through the propellers to the mass flow rate passing through the engine core.

- Safran supplies also other equipment for the Airbus Military A400M transport aircraft as the landing gear, the electrical wiring system, the navigation system and the maintenance-aid as well.