

Eurodrone Has a New Engine: Airbus Selects Avio Aereo Solutions

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The MALE RPAS Eurodrone

On 25 March, Airbus Defence and Space has finally unveiled that the Italian Avio Aero will be the company that will power the Eurodrone aerial system with a new twin-turboprop propulsion engine. After years of negotiations about the project and following a competitive tender process, the European Medium Altitude Long Endurance Remotely Piloted Aircraft Systems – MALE RPAS (Eurodrone) sees a step forward in its construction.

The MALE RPAS programme was launched in 2016 by a government-industry joint initiative that foresees the cooperation between Germany, France, Italy and Spain together with an industrial team composed of Airbus Defence and Space, Dassault Aviation, and Leonardo-Finmeccanica.

The Eurodrone is a sophisticated, remotely piloted air system project whose development is under German coordination, and its management is assigned to the Organisation for Joint Armament Cooperation (OCCAR), the European intergovernmental organisation in charge of facilitating armament programmes among its Member States.

The MALE RPAS is the first system in Europe whose design, manufacturing and services are entirely produced by adopting a fully digital approach (Digital Design, Manufacturing & Services, DDMS). The DDMS is a new construction concept expected to optimise the production chain for better products at competitive prices (Donald, 2020). According to the project plan, the Eurodrone will be about 16 meters long, and its wingspan of about 30 m. It will be able to fly for more than 24 hours, with a cruising speed of 500km/h and a payload of over 2 tonnes (Decq, 2021). In addition, Eurodrone is the first MALE designed to meet the requirements for integration into civil airspace for Medium Altitude Long Endurance (Airbus, 2022).

Its main aim is to strengthen European military activities by improving EU countries' strategic capabilities and, therefore, reinforce European Members' sovereignty in the field of defence and security. Indeed, according to the project-developing partners, its characteristics will include advanced systems for armed independent Intelligence, Surveillance and Reconnaissance missions. This will be beneficial for the defence sector of the entire European Union (Airbus, 2016). In fact, only recently, the European Commission has stressed how the MALE RPAS system has become an integral and indispensable part of defence operations as it can facilitate international conflict prevention and crisis management during all phases of military operations (European Commission, 2022). Already in 2019, after having recognised the "crucial capability for Europe's strategic autonomy" that the MALE RPAS programme can bring with it, the Juncker Commission decided to fund the project by the European Defence Fund, and it has guaranteed a budget of €100 million for the development of the Eurodrone (European Commission, 2019). Moreover, based on the 2020 contribution agreement signed between the Commission and OCCAR, in 2021, the EU Commission has recognised a new financial grant under the European Defence Industrial Development Programme as a direct award for the MALE RPAS (European Commission 2022). The project is now developing in the context of the Permanent Structured Cooperation (PESCO), and it has been considered a flagship for the innovative and strategic capacities of the EU.

The Path Towards the MALE RPAS System

To deepen the study for the MALE RPAS system design, in 2016, the industrial partners of the project approved a two-year study programme consisting of the first phase of research, dedicated to the System Requirement Review (SRR), and a second phase focusing on the Preliminary Design Review (PDR). After the first SRR validation, at the end of 2018, the Eurodrone successfully passed the final PDR step, signing one of the milestones in the programme development (Airbus, 2018).

Between 2019 and 2021, both the national and industrial Parties involved in the project have fully committed to negotiating and elaborating a global contract devoted to developing and producing the first systems of the MALE RPAS (OCCAR, 2022). More in detail, the global contract stipulates the production of twenty systems made of three drones and two ground control systems per each and their maintenance for the next five years. As established by the contract, Germany would acquire a total of seven systems, Italy is entitled to five of them, France and Spain would acquire four systems each (Rossi, 2022).

The governments of Germany, Italy, and France already approved the contract in early 2021, whereas the Spanish Council of Ministers authorised new expenditure commitments for the Eurodrone only on 25 January 2022 (Jennings, 2022). The contract was officially signed on 24 February 2022, in Manching (Germany), by Airbus and OCCAR, the former on behalf of the industrial partners and the latter representing the four EU countries involved. With a total value of €7.1million, the agreement is one of the most ambitious defence industrial programmes in Europe. It is expected to bring more than seven thousand new jobs to the Old Continent and increase European technological competitiveness and know-how in this field (Dragoni, 2022). Nonetheless, due to the delay caused by the negotiation process, the operational launch of MALE RPAS has been postponed to the year 2027 rather than 2025 as initially scheduled.

The Race Towards the Engine for Eurodrone

On 25 March 2022, Airbus Defence and Space announced having finally selected an engine type for the Eurodrone. The choice fell on the Catalyst, an engine developed by the Italian GE Aviation business, Avio Aero, which has prevailed on the French proposal, Safran.

Already in mid-2017, the Participating States agreed on the Eurodrone configuration, selecting a twin-turboprop propulsion system for the Eurodrone (Airbus, 2018). However, the delay faced during the negotiations has stalled the selection process until recently. Following a competitive tender process and in-depth technical analysis, Airbus has identified the Catalyst as “the best solution for the MALE RPAS based on its superior performance, lower development risk, better in-service economy and greater growth potential” (Airbus, 2022). The Catalyst is a flight-proven engine, entirely developed and manufactured in Europe, as it is for all the Eurodrone components. The engine has been designed as 100% ITAR-free (International Traffic in Arms Regulation), and this means that its configuration does not restrict worldwide exports or need additional requirements before receiving export authorisation.

Moreover, the Avio Aero engine has a 16:1 engine pressure ratio, one of the bests in this domain, and it is the first turboprop in aviation history made with 3D-printed components. This makes its structure lighter and more efficient, reducing consumption by 20%. The Catalyst boasts a cruising speed and payload capabilities about 10% higher than its competitors. Lastly, its electric FADEC (Full Authority Digital Engine Control) highly simplifies integration between the propeller and avionics (Avio Aero, 2022).

Without a doubt, the engine selection announcement is the hardly desired second milestone for the European MALE RPAS programme. Partners are now working on the construction of the first prototype to be prepared for the opening delivery. Once launched, the Eurodrone will sign a fundamental turnover for the European defence industry.

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