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Alenia Aeronautica: flight-refuelling simulation, a new record for the Sky-X

A new record, a world record this time, for Alenia Aeronautica, a Finmeccanica company, and for its unmanned development and demo programme: taking-off from the Italian Air Force's Amendola Base, in the Puglia Region, the Sky-X, jet unmanned aircraft, has successfully completed for the first time in the world, a series of join-up manoeuvres with another airplane to simulate a flight-refuelling operation, in a completely automated way.

During testing, the Sky-X has successfully carried out, with no intervention by the ground control station's technicians, all chasing, approaching, alignment and flight-refuelling simulation manoeuvres with a *tanker* aircraft (in this case an Alenia Aeronautica's C-27J), getting near to the air-refueller by few metres, the actual distance necessary for this operation. The Sky-X has then returned to the base, landing and rolling up to the parking area, always in a completely automated way.

Alenia Aeronautica's activity on the Sky-X, equipped with an advanced mission management system, has recently focused on developing capabilities of aircraft in flight, "chasing" and approaching to another airplane at shortest distance (in the tests made, the C-27J was flying at an altitude of 6000 feet and at 140 ktas of speed on the Adriatico Sea), in order to accomplish a "virtual" flight refuelling operation. The manoeuvre may be manhandled by the ground operators, or in a completely automated way under the total control of the Sky-X's board computer; this computer has skills of working-out flight data, planning approaching routes, enter in visual contact with the tanker, thanks to a high-performance new mission computer and to the GPS/optical chasing systems, on the basis of the sensors' reading of its *visual system*, of completing flight-refuelling mission, keeping its speed and checking its position in respect to the tanker aircraft. The system has also proved to be capable of accomplishing the outdistancing from the refueller and of re-programming routes until landing (during tests two flights have been envisaged, with two approachings, for a duration of the automated mission of over one hour, from taking-off to landing).

The target is double: to demonstrate the skill of managing flight in formation of one or more UAVs in respect to a "mother" aircraft and the possible flight-refuelling through which the already high autonomy of a surveillance UAV could reach today unimaginable levels or to guarantee the ideal mission profile with respect to the payload for a tactical-support aircraft. Furthermore, the adequate functioning of the GPS/optical system used for air-refuelling offers further flexibility options for such systems according to



Alenia Aeronautica, a Finmeccanica Company, is the largest Italian aeronautic player which operates world-wide in the commercial and military aviation, unmanned aerial vehicles and aerostructures. Alenia Aeronautica also coordinates the activities of Alenia Aermacchi and Alenia Aeronavali - wholly owned companies – respectively active in the design and manufacturing of military trainer aircraft and in the overhaul, maintenance and modification of military and civil aircraft. With its joint ventures ATR and SuperJet International, Alenia Aeronautica is the world leader in the regional turboprop market and a top player in the regional jet sector. Over 2007 Alenia Aeronautica reported revenues of 2,306 millions Euro, backlog for 8,248 millions Euro and orders for 3,104. The total workforce is 13.301.

flight autonomy, since it can be used for a completely autonomous landing system, also in absence of ground sensors and/or differential GPS systems (that is to say, with compensation of satellite signal degradation).

“The experience gained through this testing campaign” – Giovanni Bertolone, CEO of Alenia Aeronautica has declared – represents a huge step forward towards the unmanned automated flight and places our company among the leaders in this field, not only in a European perspective, but also at international level”.

Alenia Aeronautica has started a *roadmap* to define, develop and produce technological demonstrators of unmanned aircraft and to test specific technologies for the acquisition of the basic know-how in an area which shows market forecast of about €90 billions and 3000 aircraft in the next 30 years.

The Sky-X and Sky-Y demonstrators, two platforms conceived to develop, respectively, technologies and solutions for tactical support future systems and for surveillance, have allowed Alenia Aeronautica to achieve continental records in their weight category.

In particular, the Sky-X has been the first jet UAV in Europe and the first unmanned air vehicle of the Old Continent to carry out missions in a completely automated way. The Sky-Y instead, has been the first European UAV, weighing over one tonne, to fly for over 8 consecutive hours.