

Turin, 4<sup>th</sup> June, 2015

Finmeccanica-Alenia Aermacchi: European flight safety system for drones tested with success in Italy

---

Ten years after the first flight of the Alenia Aermacchi Sky-X, the first European UAV over one tonne class, thanks to a series of tests performed in Italy, an important step forward has been achieved for the future operations of the unmanned aerial systems in the civil air zone.

Currently confined to operational theatres, test areas or "corridors" completely separated from airspace reserved for civil aircraft and helicopters, the activities of the UAS (Unmanned Aerial Systems) or RPAS (Remotely Piloted Aircraft Systems), require important processes of technological change in order to exploit their full potential. Chief among these is flight safety.

To assure this fundamental aspect for the future of the unmanned aerial systems of all categories, the EDA (European Defence Agency), launched in 2009 the MIDCAS Project to identify solutions aimed at guaranteeing Mid-air Collision Avoidance, that is to say the separation between manned and unmanned aircraft and the prevention of flight collisions. And this is one of the key missing pieces for a full integration of unmanned aircraft in the civil airspace and ultimately their total commercial and institutional exploitation.

In recent weeks, from the Grazzanise Air Force Base, headquarters of ItAF's 9th Air Wing, Finmeccanica-Alenia Aermacchi has successfully completed, with its Sky-Y RPAS, an important testing cycle proving the functionality of the MIDCAS system in identification of other aircraft in potential congested flight paths (in this case an Alenia Aermacchi's C-27J intentionally flown close to the Sky-Y at different altitudes and from different directions) and the capability of changing course to avoid collision through an automatic manoeuvre. Tests were carried out with an approach of the two aircraft up to 150 meters.

Another objective of the testing was to establish the best sensors combination (by using a MIDCAS consortium designed radio, electro-optical, infra-red and radar systems) in order to feed the traffic gathering system on board the unmanned aerial system. This activity has also seen the direct participation of Finmeccanica-Selex ES that has coordinated the development of the "Sense and Avoid" sensor and supplied part of the cooperative sensors.

Chosen by MIDCAS consortium as the best platform available in Europe for this technological experimentation, Alenia Aermacchi's Sky-Y has therefore made it possible to carry out the first flight test of automatic collision avoidance based on "non-cooperative" sensors: namely the capability of also avoiding traffic of manned aircraft not equipped with transponders (aircraft identification standard system), generally used on commercial airplanes.

This new important technological goal is added to several meaningful results achieved along the years by Finmeccanica-Alenia Aermacchi's unmanned air vehicle technological demonstrators Sky-X and Sky-Y:

- Sky-X – first European UAV weighing over one tonne: 1st Flight May 2005, Vidsel, Sweden

- Sky-X – first completely automatic approach of a UAV with an aircraft simulating an aerial tanker: 28 June 2008, Amendola, Italy
- Sky-Y – first flight of a European MALE UAV equipped with diesel engine: 20 June 2007, Vidsel, Sweden
- Sky-Y – European flight duration record, 8 hours, for a UAV of the over-1000-Kg category: 25 October 2007, Vidsel, Sweden
- Sky-Y – first flight worldwide (together with the Finmeccanica-Selex ES Falco UAV) from civil airport: September 2011, Cuneo, Italy
- Sky-Y – First fully automatic coupled avoidance manoeuvres based on combined cooperative and non-cooperative detection as well as non-cooperative detection only and put on collision course with a manned aircraft: MIDCAS, spring 2015, Grazzanise, Italy

The MIDCAS is a research project contracted by EDA on behalf of the 5 partner countries (Sweden, Germany, France, Italy and Spain). Supervision and control authority is exerted through an appropriate steering body: Project Arrangement Management Group (PAMG), formed by representatives of the participating countries' Defence Ministries.

The industrial consortium is made up by Saab (coordinator) for Sweden, Finmeccanica-Alenia Aermacchi and Finmeccanica-Selex ES for Italy, Diehl, AIRBUS D&S and ESG for Germany, Indra for Spain, Sagem and Thales for France and by the aerospace research agencies CIRA for Italy and DLR for Germany.