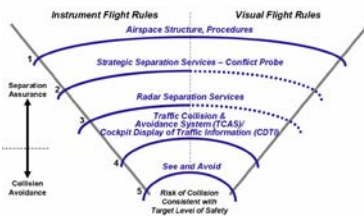


## CATECA (CApacitación Tecnológica para Evitar Colisiones entre Aeronaves)



A major requirement for Unmanned Aerial Systems (UAS) Air Traffic Insertion is the development of 'Sense and Avoid' (S&A) technologies in order for UAS to 'feel' other aircraft flying in normal airspace and to correct the course, if needed, to avoid a collision.

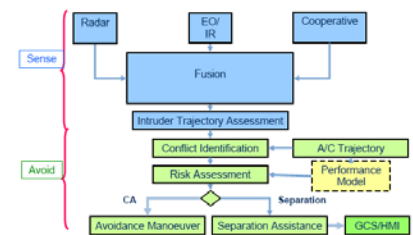
The European Defence Agency (EDA) [technological study on S&A](#) carried out in 2006-2007 allowed to demonstrate initial feasibility of S&A systems for UAS and pointed out the necessity for further safety and performance demonstration initiatives at the European level. The pilot's responsibility to "see and avoid" needs an equivalent mechanism in unmanned systems, i.e. a Sense & Avoid system to determine the presence of potential collision threats and manoeuvring clear of them.

In line with EDA study's recommendations, the [CATECA](#) project started in 2008 as a national initiative, promoted by Indra Sistemas S.A. ([www.indracompany.com](http://www.indracompany.com)) and financed by the "Centro para el Desarrollo Tecnológico Industrial (CDTI)" ([www.cdti.es](http://www.cdti.es)), as part of the Aerospace Subprogram (SAE), to develop technologies for Sense & Avoid systems.

The CATECA project was planned to generate the specification and design of systems dedicated to avoid collisions between aircrafts and was mainly foreseen as facilitator for the participation of Indra in the European MIDCAS project.

At the technological level a clear and concise objectives were established:

- Reduce risks and demonstrate the technological feasibility of a system of Sense & Avoid for UAS of different sizes
- Harmonize the technological capabilities with the requirements demanded by regulatory organizations (ICAO, FAA, EASA and National Civil aviation authorities) currently working in the development of the regulatory framework for Unmanned Aircraft Systems (UAS), which is expected to be available by 2015
- Acquire the necessary technology that allows to be able to cope with the development of a first prototype of the system in the future



The CATECA project was focused on the specification; design and modelling of the main elements of a generic Sense & Avoid system allowing to demonstrate its technological feasibility. Demonstrations through simulations of the complete system were performed.

In parallel with CATECA, some efforts have been made at other nations to identify and develop technologies for S&A which have been demonstrated in recent years. However, to reach a common view on requirements and operation together with the acceptance for the solution(s) to the S&A issue, a united effort was required where existing knowledge and conclusions are put together with a European and global perspective.

In June 2009 the signature of the [MIDCAS](#) (Midair Collision Avoidance System) contract at Le Bourget Air Show in Paris marked a milestone in this technology development under European Defence Agency's umbrella. The MIDCAS project, an EDA Category B project, is run by five pMS: Sweden (lead nation), France, Germany, Italy and Spain.

The MIDCAS industry consortium is composed of 13 companies of the five participating Member States: Saab AB (publ), Saab Aerosystems (appointed as Coordinator), Alenia Aeronautica S.p.A, Diehl BGT Defence GmbH & Co. KG, Deutsches Zentrum für Luft- und Raumfahrt e.V. in der Helmholtz-Gemeinschaft, EADS Deutschland GmbH, ESG Elektroniksystem- und Logistik-GmbH, Galileo Avionica S.p.A, [Indra Sistemas S.A.](#), Italian Aerospace Research Centre CIRA S.c.p.A, Sagem Défense Sécurité, Selex Communications S.p.A, SELEX Sistemi Integrati S.p.A and THALES Systèmes Aéroportés S.A. They hold a large portion of European knowledge on Sense & Avoid as well as on other technologies relevant for the project.

The aim of the MIDCAS project, with a value of € 50 million, is to **"demonstrate the baseline of solutions for the Unmanned Aircraft System Mid-air Collision Avoidance Function"** acceptable by the manned aviation community and compatible with UAS operations in non-segregated airspace by 2015. It is a unique project: nowhere else in the world the Sense and Avoid technologies are under development. Thus, MIDCAS can have a world-wide impact.

