Remotely Piloted Aircraft Systems

Remotely Piloted Aircraft Systems (RPAS) have demonstrated their importance in recent military operations, particularly for surveillance and information gathering. However RPAS can also offer a wide range of civil applications such as infrastructure surveillance, fire fighting, disaster or environmental monitoring, as well as border control and management.

RPAS as an EDA Pioneer Project

Pioneer Projects have been promoted by EDA to harness synergies in the military and civil domains, maximise dual-use technologies, generate economies of scale and extend the comprehensive approach into the area of capability development.

The EDA Pioneer Project on RPAS, highlighted by the December 2013 European Council, contains activities dealing with:

- Military RPAS air traffic integration
- Military RPAS airworthiness certification
- Future European Medium Altitude Long Endurance (MALE) capability
- European military cooperation in the RPAS field

Military RPAS Air Traffic Integration

At present, the use of RPAS is limited to certain areas of restricted airspace. The reason is that to date no harmonised framework is in place that allows remotely piloted aircraft to operate in non-segregated airspace. EDA contributed to the production of a roadmap on the safe integration of RPAS in European air space by 2016, thus contributing to a cooperative European approach.

Joint Investment Programme

The EDA Research & Technology Joint Investment Programme (JIP) on RPAS was launched in November 2013. Ten Member States are now involved in this activity (Austria, Belgium, Czech Republic, Spain, France, Italy, Poland, Sweden and the United Kingdom). Portugal and Slovenia are in the process of joining the JIP. This programme provides the forum to generate R&D projects for the development of key technological functions enabling safe integration of RPAS into non-segregated airspace. The following three projects are currently conducted in this framework:

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MIDCAS: MIDair Collision Avoidance System

The MIDair Collision Avoidance System (MIDCAS) project on demonstrating the sense and avoid function for RPAS was launched in 2009 with five Member States: Sweden (lead nation), France, Germany, Italy and Spain. The MIDCAS industry consortium is composed of eleven companies of the five participating Member States.

The aim of the MIDCAS programme is to provide the technical content of a collision avoidance system standard proposal for RPAS and thus to contribute to the RPAS integration in civilian airspace by proposing a baseline of solutions for the "Unmanned Aircraft System Mid-air Collision Avoidance Function" acceptable by manned aviation. Results from flight tests and simulation campaigns are expected in 2015.

DeSIRE: Demonstration of Satellites enabling the Insertion of RPAS in Europe

EDA and the European Space Agency (ESA) established their cooperation in the RPAS sector in 2010. Two feasibility studies were carried out in order to analyse the required work for demonstrations in the area of secure C2 data links for RPAS using satellites.

Based on the results EDA and ESA launched the joint DeSIRE (Demonstration of Satellites enabling the Insertion of RPAS in Europe) project in 2012. The aim of the project is to demonstrate the safe integration of RPAS in non-segregated airspace using satellites capabilities for RPAS command and control, air traffic control communications and mission data transfer to ground, in order to satisfy the needs of potential user communities.

The demonstration was carried out in Spain in Spring 2013 through several flights using a RPAS (Heron platform) providing airborne maritime surveillance services to the Spanish users involved in the project. A follow-on project (DeSIRE 2) with ESA was launched in February 2014. This activity will contribute to prepare a midterm development of RPAS independent satellite data-link service. Close involvement of rulemaking stakeholders allowed for the seamless consideration of critical certification and rulemaking issues from the beginning. This principle, combining demonstrator development, testing generic functions and operational concepts, was already successfully integrated in the MIDCAS project, allowing all relevant partners in European and international aviation to participate in the creation of a legal and regulatory framework for safe RPAS operations.

ERA: Enhanced RPAS Autonomy

RPAS automation is a key enabler for the integration of RPAS in non-segregated airspace, particularly to ensure the operation safety levels in degraded or emergency modes. Automation in RPAS take-off, landing, and taxi phases will be required for airport (civil and military) operation.

The main objectives of ERA are to establish the technological baseline for automatic take-off and landing, autotaxi, nominal/degraded mode automation functions and emergency recovery . This will be done alongside support to the regulation and standardisation of these capabilities, by providing safety assessments, procedures, simulation and flight demonstrations.

The project arrangement for ERA was signed by France, Germany, Poland, Sweden and Italy at the end of 2014, and the contract will be signed in early 2015.

Military RPAS Airworthiness Certification

Within Europe, military RPAS are certified by the national Military Airworthiness Authorities of Member States. Building upon the successes of the Military Airworthiness Authorities Forum, established by the Agency in 2008, the Agency is exploring together with these national authorities and the European Aviation Safety Agency, how to streamline the certification process for military RPAS at a European level. Significant time and cost savings, as well as harmonised safety requirements, can be expected from a common approach to airworthiness and achieving certification. An RPAS Regulatory Framework Working Group was established in EDA in March 2014 with the purpose of developing a harmonised set of airworthiness requirements and common classification and certification processes, in order to ensure that military RPAS can easily integrate into the future European Aviation System. The Agency expects that common military airworthiness and certification requirements for military RPAS will be available by 2018.

Future European MALE Capability

Considering the potential for military and civil use of RPAS in Europe, and that challenges related to the air traffic integration will be overcome in the longer term, there is a need to anticipate the next generation of MALE RPAS (beyond 2020).

The Common Staff Target to be considered as the initial step, was endorsed by the EDA Steering Board in November 2013. On that basis, three Member States (Germany, France and Italy) engaged in the process of producing common requirements for the future system. EDA supports this activity especially in the areas of air traffic integration and airworthiness certification. The next phase will be the involvement of additional Member States into a project with clear objectives in terms of performance, timescale and cost.

European Military Cooperation

Considering that the number of MALE RPAS is limited in Europe and fragmented among different Member States, EDA established a "European MALE RPAS User Community". This forum includes countries which are currently operating and/or will achieve initial operating capability in the coming five years.

The objective is to:

- Exchange information and facilitate cooperation among Member States who operate such systems in order to streamline resources;
- Exchange operational experience and best practices of operating MALE RPAS;
- Identify cooperation opportunities in the following enablers: training, logistics, maintenance of similar assets.
- Seven Member States (France, Germany, Greece, Spain, Italy, the Netherlands and Poland) are involved in this activity.

European Non-Dependence

RPAS offer a wide range of civil and military applications. The market ranges from small tactical mini and micro aircraft to large sophisticated systems. Investment in RPAS at the higher end has the additional benefit of helping to sustain European aeronautic competences in the design and engineering necessary for future manned fixed wing aircraft.

Over half the cost of building a complex intelligence, surveillance and reconnaissance RPAS is related to sensing technologies and data exploitation capabilities; excellence in these areas will be necessary for future industrial competitiveness in the global marketplace. At present there is the risk that Europe could become dependent on third country suppliers for such technologies. All EDA's current activities in the RPAS domain are aiming at ensuring that this level of dependence is under control.

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