



ABOUT THE PROJECT

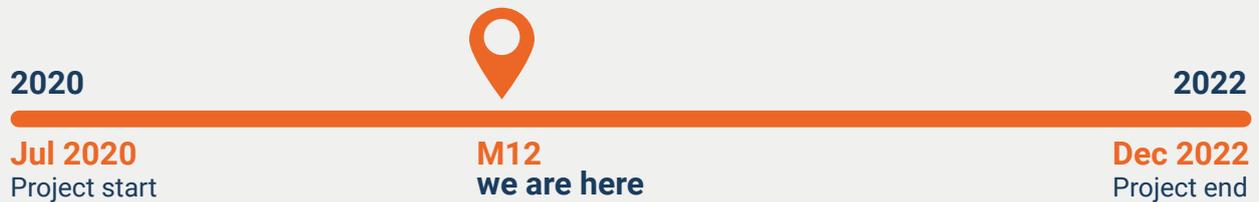
INVIRCAT (IFR RPAS Control in Airports and TMA) is a project funded by the SESAR Joint Undertaking as part of the SESAR 2020 Exploratory Research initiatives.

The main purpose of the project is to investigate innovative solutions for the safe and equal integration of remotely piloted aircraft systems in the terminal manoeuvring area and airport environments without entailing a significant impact on current airspace users. This process is guided by an innovation pipeline through which the European ATM community can explore new ideas, validate them with industrial partners and then demonstrate their viability for implementation.



TIMELINE

This timeline shows the progression of the project and the main deliverables submitted so far. In the first 12 months, 12 of 20 deliverables have been submitted. Eleven of these deliverables have been already approved by the SJU, one deliverable has just been finished and submitted.



Our main publicly available deliverables

see www.invircat.eu

D2.1

Current State-of-the-Art and regulatory basis

This deliverable provides the project state-of-the-art focusing on three main aspects of RPAS integration: **technologies, human aspects** and **applicable rules and standards**.

It also includes information about other past and present activities carried out in Europe, and more specifically within the SESAR framework.

D2.2

Use Cases Definition and Concept Outline

This deliverable describes the **use cases** and outlines the **INVIRCAT concept for the integration of RPAS** into the existing ATC procedures and infrastructures within TMAs and at airports under Instrument Flight Rules. It represents an initial step towards the creation of a Concept of Operations (CONOPS) for RPAS in the TMA and on airports.

D2.3

Initial Concept of Operations

The definition of the CONOPS serves as a basis to **investigate the influence of the integration of RPAS on ATC** and other aircraft in the defined use case scenarios. Based on the results of the simulations the final CONOPS and a set of high level operational and technical requirements will be defined.

CONCEPT OF OPERATIONS

The Concept of Operations (CONOPS) for RPAS in the TMA gives a comprehensive overview of the systems and operations needed to support the integration of RPAS into existing Air Traffic Control (ATC) procedures at and around airports. The concept focusses on fixed wing RPAS of the traffic class VI, that are capable of flying under Instrument Flight Rules (IFR) and more specifically Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs) in airspace classes A-C.

The goal of the CONOPS is to provide a guideline for the integration of fixed wing RPAS of varying sizes and performances in medium to complex TMAs and airports, envisioning the potential use of RPAS for a widespread array of civil and military applications. Therefore, the document aims to define a CONOPS that is applicable to multiple RPAS operating simultaneously in a shared airport environment with manned aviation. In order to minimize the risk associated with remotely piloted aircraft (RPA) in the TMA, the CONOPS introduces the use of automatic take-off and landing (ATOL) systems including the inherit system and operational requirements.

VALIDATION ACTIVITIES

INVIRCAT project intends to validate the INVIRCAT CONOPS for RPAS in the TMA by developing human-in-the-loop real-time simulation scenarios that address all defined project validation objectives.

These objectives address nominal operations, as well as a number of contingency operations (such as transponder failure or R/T failure), conflict situations and the impact of C2 link and voice latency. For all of these situations, RPAS pilots and ATC feedback will be gathered and analysed with regard to acceptability of concept and procedures, adequate phraseology and information provision, the requested human contribution, acceptable safety levels, as well as acceptable workload levels. Furthermore, a reference situation without RPAS traffic will be compared with the INVIRCAT scenarios to determine the impact of the integrated RPAS operation on equity (in terms of delays) and runway throughput.

The simulation activities will be divided among consortium partners CIRA, DLR and NLR. While CIRA will focus on the Automatic Take-off and Landing (ATOL) operation, NLR will give particular attention to the latency impact, and DLR will specifically investigate the arrival phase and selected contingencies.

In addition, DLR and NLR will perform a distributed simulation with a handover procedure between different remote pilot stations (RPS).

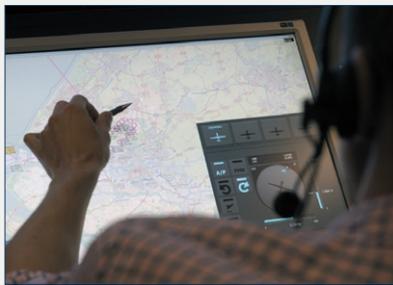


WHAT'S NEXT



Events | 11th EASN Virtual International Conference

INVIRCAT will attend the 11th EASN International Conference on “Innovation in Aviation & Space to the Satisfaction of the European Citizens”, taking place from the 1st until the 3rd September 2021. The INVIRCAT project will be involved in a joint session about RPAS integration, together with the other RPAS-related projects: URClearED, SAFELAND, SESAR Joint Undertaking PJ13 Sol117 and CORUS-XUAM. For more information about agenda and registration visit the website easnconference.eu.



D2.5 Preliminary requirements definition

This deliverable defines a set of high-level requirements on technical capabilities and procedural means to allow IFR RPAS to safely operate in airport environments. This includes requirements to fully comply with ATC instructions and the development of new procedures and tools to allow ATC to handle IFR RPAS in a cooperative environment with the objective of full integration with manned aviation.

CONSORTIUM

The INVIRCAT consortium is formed of a balanced group of 7 partners, representing some of the most innovative research establishments in Europe in the fields of Air Traffic Management, Air Traffic Control, Unmanned Aerial Systems, Unmanned Aircraft System Traffic Management (UTM) and Urban Air Mobility.



