



UAS Bulletin

European Civil Aviation Conference Bulletin on Unmanned Aircraft Systems

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» FOREWORD

It is my pleasure to announce the release of the first ECAC UAS Bulletin. In this new online publication, we will address the key Unmanned Aircraft Systems (UAS) initiatives making progress in ECAC Member States and internationally, as well as the strategic aspects to be considered for the development of this sector.

In recent years, the UAS industry has become a strategic segment of aviation, with significant implications for other industries. Innovation and technological development play a major role in this sector, which possesses great potential.

One of the main objectives of ECAC's drone agenda is to promote an exchange of high-level perspectives on possible UAS developments in order to meet the challenges facing the sector. Various initiatives are already being launched by ECAC Member States regarding implementation of the new European framework, the U-space concept and Urban Air Mobility.

This first edition of the UAS Bulletin is organised in three parts: the first addresses the measures being promoted by some ECAC Member States (Croatia, Finland, Georgia, Germany, Poland, Spain and Switzerland), the second focuses on the UAS initiatives taken by European organisations (EASA, EUROCONTROL) and others such as JARUS and ICAO, and the third presents measures developed by two

strategic partners (China and the United States), to offer a global perspective of different ways to approach the development of UAS.

We hope that starting with this very first edition, the ECAC UAS Bulletin will be used to broadcast the numerous actions being taken by States and organisations in the ECAC region and on the international scene.

The next editions will include other initiatives, thus fostering an exchange of experiences and information on this subject among Member States and leading to the construction of a strategic drone observatory within ECAC.

Before concluding the presentation of this first edition, I would like to thank the States and organisations for contributing the valuable information that has made this publication possible. ■

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DGCA Spain

ECAC Focal Point for Unmanned Aircraft Systems (UAS)

UAS, A STRATEGIC SECTOR AS A LEVER FOR GROWTH

Undoubtedly, one of the main milestones in Europe's recent drone history was the approval in 2019 of the EU regulations that will shape the new drone design, operation and production scenario, which have recently come into effect. Incidentally, the U-space Regulation was approved in February 2021. This regulation is a major step towards the development of highly automated operations in all types of environments, including urban areas.

The implementation of these regulations will allow for progress towards the harmonised development of this segment of activity.

Despite its exponential growth, there



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is still a long way to go. This segment of activity will face significant challenges in the future, such as U-space and urban air mobility, among other issues.

In this sense, it is essential for ECAC Member States to have visibility on the main initiatives being carried out in

strategic areas within Europe. This will be critical for fostering cooperation between countries, which will contribute to the development of the sector. Likewise, exchanging experiences with strategic partners on an international level is considered a useful step. ■



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CROATIA



Development of the regulatory framework

Croatia is currently focused on the establishment and publication of UAS geographical areas, online platforms for operator registration and for training and monitoring of drone pilots, and an application for airspace management, airspace requests and obtaining authorisations.

All these activities are framed within the new EU regulatory framework. They are aimed at the safe and efficient integration of UAS operations into existing airspace structures.

Moreover, Croatia is promoting workshops to disseminate the new regulatory framework and has proposed the Croatian air navigation service provider (ANSP) as UTM provider. ■

FINLAND



Finland is preparing an action plan for transport automation and a legislation that will cover all modes of transport. The proposed measures will set out the steps to be taken over the next 12 years.

Development of the regulatory framework

Finland is currently engaged in a process of regulatory adaptation regarding UAS. Its goal is a completely safe integration of drone operations.

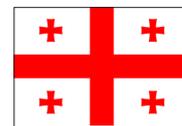
Among the activities it has undertaken to harmonise its internal framework with EU regulations, Finland has already established UAS geographic zones around all aerodromes in the country and is designing them in other areas. New UAS geographic zones are expected to be published during spring 2021.

Other projects

Finland is working on conditions for the use of drones in agriculture applications such as spraying phytosanitary products.

Additionally, Finland has been working on relevant operations to enable an autonomous drone delivery service, boosting the transport of goods, minimising traffic congestion in cities and helping to reduce emissions. ■

GEORGIA



Following the approval of the EASA framework, Georgia has developed new national UAS regulations that have already entered into force. It has also published two standard scenarios in line with the European standard scenarios published alongside EU regulations.

Georgia also establishes mandatory registration of UAS operators. To this end, it has developed an application to carry out online registration on its own drone website under its civil aviation authority.

Finally, the country has developed another application to perform remote pilot proficiency tests and to issue the corresponding certificates. ■

Further information at: <https://uas.gov.ge/EN>

GERMANY



Germany is carrying out initiatives to harness the vast potential of drones. To this end, it has developed the «Action Plan for UAS and Innovative Aviation Concepts».

Development of the regulatory framework

In February 2021, a process of regulatory adaptation to the new EASA context began. Some of the initiatives promoted by Germany are the assessment and adaptation of geographical limitations or the reduction of administrative burden.

Germany is also taking action so that operations of air taxis and other unmanned aircraft requiring certification have to meet similar requirements to those of conventional manned aviation.

U-space concept

In order to achieve seamless integration of UAS in existing airspace structures, Germany is designing the establishment of a U-space testing field, which will turn in significant research results for the country.

New applications and UAM

Germany has launched a financing programme for projects on drones and air taxis («From the Laboratory into the Air») aimed at the development of a variety of novel applications that use this type of aircraft. Additionally, a total of five German regions are involved in the European initiative on Urban Air Mobility.

Infrastructure protection

Germany relies on a combination of sensors for the defence of larger airports and has several projects related to the security of such operations. ■

POLAND



U-space concept

Poland is promoting actions to implement services and solutions for UAS traffic management, fostering the development of large-scale unmanned aviation. It is also working towards the improvement of training and administrative processes through the «Digital services for UAVs» project.

The country's strategies for responsible and sustainable development are aimed at safely and effectively integrating unmanned aircraft and achieving the appropriate infrastructures for their safe use and development.

Urban Air Mobility (UAM)

Regarding urban air mobility, Poland is involved in several projects for the implementation of UAM services in urban areas. To this end, it is developing solutions for integrating UAS with ATM and in urban scenarios within the ASSURED UAM project.

Additionally, Poland participates in project X-TEAM, which seeks the integration of ATM and air transport within a global intermodal network that allows door-to-door connectivity in any place in Europe. This project is part of the SESAR Horizon 2020 programmes.

Tests with drones

Poland has its own test area for drones, the CEDD (Central-European Drone Demonstrator). This area contributes to the development of the drone industry and will enable the country to test the practical uses of these aircraft before their actual implementation. ■

SPAIN



Following the entry into force of the EU regulation, Spain is developing a new national regulatory framework to adapt to it and to define the parameters that remain under the responsibility of States.

Recently, the Ministry of Transport, Mobility and Urban Agenda has published the Strategy for Safe, Sustainable and Connected Mobility, which will define the steps to follow in terms of mobility in Spain. This strategy positions drones as a key element to foster smart mobility solutions, driving the development and innovation of this ever-growing sector.

Further information at: <https://esmovilidad.mitma.es/>

Development of the regulatory framework

To pursue the further regulatory development of drones, Spain is currently adapting its regulations to the new EU framework. The future Spanish UAS regulation will develop issues such as UAS geographic zones or minimum age for drone pilots, to complement EU legislation.

Spain has an online application for registration as a UAS operator and to submit declarations and authorisation requests to operate in certain airspaces.

On another note, Spain's main provider of air navigation services, Enaire, has developed an application called «Enaire DRONES» that gathers all the information on airspace limitations for the use of drones. The areas with prohibitions or restrictions, as well as the conditions for possible coordination, can be consulted in this application. Further information at: <https://drones.enaire.es/>

U-space concept

The main Spanish drone entities are working on the deployment and implementation of U-space services. Spain has actively participated in the regulatory development of the U-space Regulation.

Additionally, several Spanish institutions and companies have participated in the European network of demonstrators through European projects such as DOMUS. Thanks to these trials, U-space services have been tested in different scenarios, and the results are expected to provide experience to achieve the safe and efficient integration of drones.

Finally, Spanish companies will also lead projects focused on issues such as the drones' communication needs, their requirements to operate at low altitude or the distance between them.

Urban Air Mobility (UAM)

Innovations in the sector are giving way to operations that have a great margin for development at present, such as the transport of goods, drone parcel delivery or, in the medium to long term, the transport of people by air taxi.

Spain is involved in projects such as AMU-LED or CORUS-XUAM, which aim to demonstrate the safe integration of drones in the airspace of our cities. These tests are performed with the objective of demonstrating the benefits of air mobility, such as eliminating road congestion or reducing travel times. Their results will contribute to the development and establishment of regulations on urban air mobility at European level.

Additionally, Spain has launched a project to develop the first infrastructure network for vertical take-off electric aircraft, which aims to establish over 20 VTOL (Vertical Take-Off and Landing) ports.

Infrastructure protection

In Madrid and Valencia, the Spanish law enforcement forces and agencies have a global anti-drone system that can locate and position drones as well as their pilots. Local authorities can thus ensure drones in the city are used in accordance with established regulations.

On another note, tests for the defence against airport drones were organised in Asturias to identify the most suitable C-UAS companies and systems for the defence of the airport environment.

Test centres

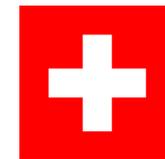
In Spain, most of the research efforts are condensed in public bodies such as the INTA (Spanish National Institute for Aerospace Technology), foundations such as FADA (Andalusian Foundation for Aerospace Development), technological centres and universities.

Centres specialised in drones are the basis for the development of new prototypes and solutions, as they enable experimental flights in airspaces without operational constraints.

There are currently three such centres in Spain: the Rozas Airborne Research Center (Galicia), the Air Traffic Laboratory for Advanced unmanned Systems (Andalusia) and the BCN Drone Center in Moià (Barcelona).

Finally, thanks to the Hera Drone Hub project, Zaragoza will be the first European city to authorise a testing and training space for drones in an urban environment to develop the air mobility of the future.

SWITZERLAND



U-space concept

Since the end of 2018, Switzerland has been collaborating with its air navigation service provider, as well as with various companies in the UAS field, to carry out activities aimed at identifying, quantifying, developing and implementing its U-space abilities and technologies in its airspace, through the Swiss U-Space Implementation (SUSI) initiative.

Other projects

In addition, Switzerland is developing other projects related to drone operations in the vicinity of aerodromes, where the remote identification service plays an essential role, and contributes to numerous European initiatives to develop the sector and further promote UAS operations. ■

UAS INITIATIVES BEING TAKEN BY EUROPEAN ORGANISATIONS

EASA



One of EASA's main objectives is to promote and implement high common safety and environmental protection standards in Europe's civil aviation sector. To this end, it has led and promoted regulatory initiatives that will allow a harmonised operation

of drones throughout Europe, ensuring, among other things, that drone operations are carried out with full guarantees and a safe integration with traditional aviation.

Main regulatory initiatives

In 2019, two regulations essential for the development of this segment of activity were enacted: EU Regulation 2019/947, which addresses and regulates aspects related to the operation of these platforms, and EU Regulation 2019/945, which addresses

technical issues of aircraft, such as their design and manufacture. EASA thus brought the new European framework on drones to fruition, which will protect citizens' safety and privacy while allowing these products to circulate in Europe. Both EU regulations came into force on 31 December 2020.

The new regulations are focused on regulatory harmonisation in the European Union to allow for their design, operation and marketing, and they both provide for a risk-based approach to operations.

EASA is also developing the regulatory package for the «certified» category – operations of greater complexity that require a certification process, like the process carried out in conventional aviation, which covers the transport of people, dangerous goods, or the flight of large drones over concentrations of people. Its development will make it possible to exploit the full potential of these aircraft.

Further information at: <https://www.easa.europa.eu/domains/civil-drones-rpas/drones-regulatory-framework-background>

U-space concept

The proper and efficient integration of the high number of drones expected in the coming years, as well as their interaction with conventional aviation, require the development of a system to manage them. However, before this it is essential to have a regulation in place that establishes this concept and that lays the groundwork for their further development.

On 23 February 2021, EASA's Committee approved the regulatory package on U-space, which develops a new operation concept based on high digitalisation and automation levels to support a safe and efficient way for drones to access airspace in harmonious coexistence with the ATM (air traffic management) system.

Its publication is scheduled for September 2021, although it will not come into force until January 2023.

Further information at: <https://www.easa.europa.eu/domains/civil-drones-rpas>

Environment: noise

Drones and new aircraft for urban air mobility are expected to have an acoustic impact on cities, especially in densely populated areas. In order to make their operations compatible with appropriate noise levels that ensure the well-being of citizens, EASA is carrying out environmental research on helicopter and drone noise called «Environmental Research – Rotorcraft Noise».

Defining a new methodology to represent these aircraft's noise and to prepare potential mitigation measures in advance, especially in urban environments, is therefore considered a priority for EASA.

Drone incidents: C-UAS

EASA recently published a manual for managing drone incidents addressed to aerodrome operators. Its objective is to develop adequate procedures that provide a fast, effective and proportionate response in order to avoid or minimise air traffic disruptions, airspace closures or even airport closures.

This document is organised into three parts, the first of which is publicly available. The other two are addressed to national authorities and to third parties involved in managing this type of incident, who will be able to share them with organisations under their supervision.

Further information at: <https://www.easa.europa.eu/newsroom-and-events/press-releases/easa-issues-guidelines-management-drone-incidents-airports>

Collisions between drones and manned aircraft

EASA is carrying out studies on the effects of these possible collisions with conventional aircraft. In this area, the study «Vulnerability of Manned Aircraft to Drone Strikes» is worth mentioning. Through experimental and simulation tests, EASA has carried out an analysis of the effects of possible collision between drones and manned aircraft. It is expected that, through this initiative, we will be able to identify drone design strategies that reduce risks for conventional aircraft in the event of a collision, and establish design requirements and testing standards for future drones to be marketed in Europe within the «open» category. ■



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EUROCONTROL



EUROCONTROL

EUROCONTROL's role is essential for the development of new operating concepts at European and global level. With regard to drones, the Agency's aim is to achieve a safe integration of these aircraft in airspace, while safeguarding the civil rights of all airspace users.

The Agency is involved in a large number of research and development projects on drones and related technologies.

EUROCONTROL contributes with its experience in this field in project management, validation process development, experimental design, data analysis and human factors.

Likewise, the organisation provides technical and operation support to the main institutions in the sector (ICAO, EASA, EUROCAE or IATA, among others) for the development of regulations and standards on UAS, C-UAS systems or U-space.

Equally, the important support to States that EUROCONTROL provides is worth mentioning. For instance, it has prepared an initial guide for the assessment of airspace as a basis for the integration of UAS, which makes it possible to identify the operations that could be carried out in airspace volumes, as well as the analysis of the associated risks on the ground and in the air.

In view of the future Paris 2024 Olympic Games, the drone unit is supporting the establishment of a test to validate scenarios and equipment for the use of UAS during this important event.

EUROCONTROL also develops coordination and information exchange initiatives with other regions such as the United States, China and Australia, among others, to guarantee adequate interoperability worldwide.

Finally, its work in the fields of training and information sharing through initiatives that offer its participants an overview of the most current aspects of the drone industry, as well as relevant concepts related to the concept of U-space operation, is extremely noteworthy.

U-space concept

To assess the safety of drone operations and address the adequate integration of these platforms in complex environments such as cities, EUROCONTROL has created a U-space operational concept through the CORUS project (Concept of Operation for European UTM Systems), in which organisations from Belgium, France, Germany, Italy, Spain and the United Kingdom participate. This project will provide a harmonised tool for the integration of low-level operations, mainly in urban environments.

The Agency has also coordinated the PODIUM project (Proving Operations of Drones with Initial UTM Management), which has made it possible to test U-space procedures and technologies in different European cities with the objective of assessing this technology's readiness level and issuing recommendations for its deployment.

It should be noted that many of the new U-space technologies are at an early stage of development. Accordingly, and with the aim of facilitating the exchange of knowledge and supporting the implementation of these technologies, EUROCONTROL has promoted the European Network of U-space Demonstrators.

Urban Air Mobility (UAM)

EUROCONTROL is actively working on testing and providing U-space services and solutions to support urban air mobility through the CORUS-XUAM initiative, including testing surveillance and inspection operations in urban ports, optimising routes between airports and metropolitan areas, the transport of goods in residential areas, autonomous intercity flights or connections between airports and VTOL (Vertical Take-Off and Landing) ports. ■

ICAO



ICAO promotes initiatives internationally for the global harmonisation of the UTM concept and the use of drones in humanitarian and development aid applications. For the sake of global harmonisation and interoperability, it is essential to establish common action principles regarding the UTM concept. To this end, ICAO has promoted, together with States, the industry and professionals, a guide entitled «*UTM – A Common Framework with Core Boundaries for Global Harmonization*», where the problems and challenges to be addressed for the development of this concept are analysed.

ICAO has thus taken the necessary steps to provide States with a common definition framework for the implementation of UTM systems. This initiative has been articulated through the UAS Advisory Group.

Also, in order to ensure a safe interaction between UTM and ATM systems, ICAO has developed the document «*RPAS Concept of Operations for International IFR Operations*», which takes into account the ATM-UTM interaction as well as key elements such as drone registration, identification or geo-awareness, among others.

Humanitarian aid and development

The ICAO Task Force on UAS for Humanitarian Aid and Development (TF-UHAD) aims to take advantage of drones' capabilities to perform humanitarian aid and development tasks. ■

UAS INITIATIVES BEING TAKEN BY EUROPEAN ORGANISATIONS

JARUS



JARUS (Joint Authorities for Rulemaking on Unmanned Systems) consists of worldwide experts knowledgeable in UAS regulatory matters. This organisation aims to recommend technical, safety and operational requirements related to all aspects of the safe operation of unmanned aircraft systems, both in airspace and in airports.

It focuses on the development of guidance material that fosters national authorities' development of common requirements, thus avoiding duplication of efforts. It seeks to promote a harmonised approach, complementary to the efforts carried out by other organisations.

Currently, 63 countries (of which 36 ECAC Member States¹), together with EASA and EUROCONTROL, contribute to the development of JARUS.

JARUS Working Groups

Seven working groups are integrated in JARUS: Flight Crew Licensing (WG1), Operations (WG2), Airworthiness (WG3), Detect and Avoid (WG4), Command and Control (WG5), Safety and Risk Management (WG6) and Concept of

Operations (WG7).

JARUS is currently focusing on the creation of a high-level framework to address the key elements for the operation and integration of UAS, taking into account, for instance, the development of concepts of operations that describe the roles of each actor involved in UAS operations. ■

¹As of March 2020: Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Malta, Moldova, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

MEASURES TAKEN BY ECAC'S PARTNER STATES

CHINA



UTM concept

China is developing its own system for UAS operations management (known as UOMS - Civil UAS Operation Management System), which will have several suppliers who will provide registration, alerts or aircraft location services, among others. Its objective is to integrate the UOMS system within the ATM system and the system responsible for general aviation. An interface between the cloud containing all drone flight information and UAS operations has been one of the tasks carried out for its development.

Additionally, China is performing tests to assess UOMS information systems and their coordination with general aviation, as well as tests with large UAS. ■

Further information at: <https://www.airbusutm.com/uam-resources-airbus-blueprint>



UNITED STATES



The United States' UAS activities focus on the following areas:

Authorisations: LAANC (Low Altitude Authorization and Notification Capability)

The Federal Aviation Administration (FAA) has developed a collaborative approach between government and industry to promote the sharing of information and data on airspace and directly support UAS integration. This has resulted in an automatization of the request and approval processes for low-altitude airspace authorisations (below 400 ft) and the exchange of information on geographical flight restrictions for all users.

Click [here](#) for additional information about LAANC.

UAS Integration Pilot Program + BEYOND

The US has conducted numerous tests within its airspace to assess the integration of civil and public drone operations. Currently, the FAA is addressing the challenges for full integration of these aircraft through the new «BEYOND» program – challenges such as BVLOS operations, especially for infrastructure inspection or package delivery with drones – all with the objective of harnessing the social and economic benefits this industry can offer.

Further information about UAS Integration Pilot Program at:

https://www.faa.gov/uas/programs_partnerships/completed/integration_pilot_program/

Further information about BEYOND program at:

https://www.faa.gov/uas/programs_partnerships/beyond/

UTM Pilot Program

To achieve the necessary infrastructure to support the huge growth in drone operations, in recent years the FAA and NASA have been defining the services, abilities and technologies required for a safe and efficient drone traffic management.

Further information at:

https://www.faa.gov/uas/research_development/traffic_management/utm_pilot_program/

FAA International Research Round Table

Since November 2020, the FAA has been organising bimonthly international meetings with major authorities to exchange information on their UAS programmes and research tasks, aiming towards safe integration.

Authorities from five continents have joined these meetings: FAA, Australia, Canada, Israel, Brazil, Singapore, South Korea, United Kingdom, Japan, Switzerland and Spain, among others. In these meetings,

the most relevant priorities and challenges of UAS integration identified by States are addressed, while information and experiences on implementation projects are shared to address these issues. Among the topics discussed are BVLOS operations, conflict detection and avoidance, new technologies, UTM-ATM interaction, regulations and certification, and urban air mobility. ■



Our mission is the promotion of the continued development of a safe, efficient and sustainable European air transport system

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